

KNOXVILLE WILDLIFE AREA MANAGEMENT PLAN



Approved by:

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Date



California Department of Fish and Game, Central Coast Region
Final - October 2005

ACKNOWLEDGMENTS

This Plan is the product of a joint effort by the Department of Fish and Game (DFG) and the University of California Davis (UCD), Department of Environmental Science and Policy (DESP), Natural Reserve System (NRS) and Information Center for the Environment (ICE). The core project team included the following individuals (in alphabetical order by last name):

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The project team also acknowledges the contribution of those individuals who attended the public input meetings or provided oral or written input during the planning process.

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LIST OF TERMS

The following acronyms and defined terms are used in this Plan with the meanings that are indicated below:

BLM	U.S. Department of the Interior, Bureau of Land Management
BOR	U.S. Department of the Interior, Bureau of Reclamation
BRBNA	The Blue Ridge-Berryessa Natural Area—an area defined roughly by the Putah Creek watershed and the Cache Creek watershed below Clear Lake.
CRHR	California Register of Historic Resources
Department	The California Department of Fish and Game
KWA	Knoxville Wildlife Area
MCV	The Manual of California Vegetation
Special status species	Species that are State or federally listed as Threatened, Endangered, those considered as candidates or proposed for listing, State Species of Special Concern, and plants considered by the California Native Plant Society as rare, threatened, or endangered.

I. INTRODUCTION

The Knoxville Wildlife Area (KWA), located in the inner north coast range of California at the northeast end of Napa County, comprises over 8000 acres of oak woodland, grassland, riparian, and chaparral habitat. The KWA was acquired by the Department of Fish and Game (the Department) in 2000 to protect and restore its grassland, woodland and riparian habitat, all of which are important natural resources in California. Native grasslands and streamside vegetation are among the most threatened plant communities in California. More than 99% of California native grasslands have been lost or become dominated by non-native species, and over 95% of historic streamside shrubs and trees have been lost to urbanization, agriculture, flood control, grazing, and invasion by non-native species (USFWS 2001). Riparian areas, in particular are home to a high proportion of rare or threatened species. Oak woodlands, while still covering about 7 million acres in California (Allen et al. 1991), are becoming increasingly threatened by rangeland clearing, firewood harvesting, agricultural development, urbanization, poor regeneration, and most recently, sudden oak death (Standiford et al. 2002). Oak woodlands provide breeding habitat for more than 300 vertebrate species and habitat during winter or migration for many others (Block et al. 1990). Figure 1 depicts the location of the KWA.

This Management Plan is a product of the Department's commitment to manage the resources of the KWA in accordance with state and federal laws, incorporating the best available scientific information and professional judgment. This Plan also incorporates the Department's commitment to coordinate and cooperate with KWA neighbors, members of the Blue Ridge-Berryessa Natural Area (BRBNA) Conservation Partnership, and other individuals and agencies managing lands within the BRBNA. This plan proposes science-based conservation of the natural ecosystem and provides for compatible public use. Management of the KWA is to be guided by the mission of the Department, the purpose of wildlife areas, and budgetary limitations.

❖ Mission of the Department

The Department of Fish and Game, as part of the Resources Agency of the State of California, has the following mission to guide its planning and operations:

The Mission of the Department of Fish and Game is to manage California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public.

The Department of Fish and Game maintains native fish, wildlife, plant species and natural communities for their intrinsic and ecological value and their benefits to the public. This includes habitat protection and maintenance in a sufficient amount and quality to ensure the survival of all species and natural communities. The Department is

also responsible for the diversified use of fish and wildlife including recreational, commercial, scientific and educational uses.

❖ **Purpose of Wildlife Areas**

The Department of Fish and Game currently manages over 100 state wildlife areas. These areas are scattered throughout the state, most located in central and northern California. The state owns about two-thirds of the total acreage while the remainder is managed under agreements with other public agencies.

The state acquired these wildlife areas to protect and enhance habitat for wildlife species, and to provide the public with wildlife-related recreational uses. These lands provide habitat for a wide array of plant and animal species, including many listed as threatened or endangered.

❖ **The Management Plan**

The Department develops management plans for all Department-administered lands. The Department's purpose in preparing these plans is multifold:

- to guide management of habitats, species, and programs to achieve the Department's mission to protect and enhance wildlife.
- to identify appropriate public uses of the property.
- to serve as a descriptive inventory of fish, wildlife and native plant habitats that occur on or use the property.
- to provide an overview of the property's operation and maintenance, and personnel requirements to implement management goals. It also serves as a budget planning aid for annual regional budget preparation.
- to provide a description of potential and actual environmental impacts and subsequent mitigation that may occur during management, and to provide environmental documentation to comply with state and federal statutes and regulations.

In addition, this plan has the following purpose that is specific to the KWA:

- to direct an ecosystem approach to the management of the KWA in coordination with the Blue Ridge-Berryessa Natural Area Conservation Partnership and in a manner that promotes cooperative relationships with owners and managers of adjoining private and public lands.

❖ The Planning Process

Preparation of this plan was a joint effort involving staff from the Department, the University of California Davis Natural Reserve System (NRS), and the University of California Davis Information Center for the Environment (ICE). The Department provided overall guidance to the planning process and was responsible for all decisions about the content of the plan. The University, under contract to the Department, provided technical and scientific expertise, Geographic Information System support, and was responsible for most administrative aspects of the Plan including preparation of initial drafts. The UC Davis NRS and ICE have expertise specific to the KWA. The UC Davis NRS administers the McLaughlin Reserve, which is adjacent to the KWA, and Reserve staff members as well as several University faculty have expertise in local resource management issues. Also, independent of this Plan, UC Davis ICE has been coordinating a new vegetation mapping effort for Napa County. This vegetation map lays the framework for resource management within the KWA.

A core group of Department and UC staff worked closely together during plan development. This group solicited input from additional Department staff and University staff and faculty as needed, and reported directly to the Supervising Biologist for the Department's Central Coast Region. Information to guide the Plan's content came from four primary sources:

1. Department policy and federal and state law.
2. Public input solicited during a public outreach program.
3. Consultation with BRBNA Conservation Partners and other area land managers as part of an integrated planning program.
4. Gathering of information about the occurrence of biological and cultural resources (including limited field surveys), and analysis of scientific literature to assess the efficacy of different management strategies.

Policy direction—Management goals for the KWA must fit within the mission of the Department, Department regulations for Wildlife Areas, and state and federal laws; including the Endangered Species Act, the California Environmental Quality Act, and the American's with Disabilities Act. These policies and laws provided a framework with which to guide the overall direction of the Plan, to evaluate public input (e.g., to determine the compatibility of proposed public uses), and to prioritize resource surveys and management goals (e.g., to identify and protect sensitive species or historical resources).

Public outreach—The Department's goal in formulating this Plan was to ensure that the public was given adequate opportunity to express their desires regarding management and public use of the KWA, and to consider these desires in conjunction with the other three sources of information that guided the Plan's content. The centerpiece of this effort was a pair of public outreach meetings to obtain direct input from both organized groups and individuals interested in the Wildlife Area. These meetings occurred on August 6, 2003, at the Napa Public Library, and October 20,

2003, at the Woodland Public Library, both from 6:45 to 8:30 PM. Attendance at these meetings was 47 and 20, respectively. Announcements for each meeting were posted on the Department's web site and sent to newspapers in Lake, Napa, Yolo, and Solano Counties. In addition, announcements were sent specifically to local hunting, hiking, bicycling, and equestrian groups to ensure that all potential Wildlife Area users were represented. Each meeting was moderated by University staff members and began with a brief presentation by Department and University staff outlining the planning process, the mission of the Department, and the natural and physical features of the Wildlife Area. Both meetings solicited input for two Wildlife Areas, the KWA and the Cedar Roughs Wildlife Area.

Following the introduction, the meeting moderators accepted oral comments from meeting attendees about the issues they would like addressed in the management plan. The moderators did not respond to or discuss comments during the meeting, other than to try and clarify points that were made by participants. The intent of the meeting was to gather ideas and information, rather than to debate which management strategies were appropriate for the Wildlife Area. As comments were made, they were transcribed onto poster paper. At the end of the meeting, each participant was given 5 adhesive dots, which could be placed by any of the comments. Participants were asked to place the dots on comments with which they strongly agreed or felt were most important. This procedure permitted all comments to be ranked in terms of their relative importance to attendees.

In addition to taking oral comments, meeting participants were given forms with which they could submit written comments. Written comments were accepted by e-mail or mail through December 2003. All input received during meetings or in writing is summarized in Appendix A.

Integrated planning—The Knoxville Wildlife Area is part of a mosaic of public and private properties that comprise the Blue Ridge-Berryessa Natural Area (BRBNA), which encompasses the watersheds of Putah and Cache Creeks. Other substantial conservation ownerships within the BRBNA include those of the Bureau of Land Management (BLM), the University of California, Natural Reserve System (UCNRS), the Bureau of Reclamation (BOR), and the Gamble Ranch. In preparing the Management Plan for the KWA, coordination with these agencies and landowners maximizes the benefit of the Wildlife Area for ecosystem functioning, and for maintaining fish, wildlife, and plant habitat. Coordination also promotes cost effective management for all conservation owners and quality recreational opportunities for the public while safeguarding private property rights. Coordination was important during the preparation of this Management Plan and will continue to play a role in the ongoing management of the Wildlife Area. The Integrated Planning Program facilitated coordination using two approaches: (1) direct contacts with agencies and landowners, and (2) use of the BRBNA Conservation Partnership as a clearinghouse for information regarding this Management Plan and as a forum for input from interested parties. The BRBNA Conservation Partnership is a voluntary and inclusive organization of public, private, and non-profit partners who have a shared goal of promoting the conservation and

enhancement of the lands that comprise the BRBNA by encouraging the sensitive management of its natural, agricultural, recreational, archeological, and historical resources.

This Integrated Planning Program was intended to guide the preparation of this Management Plan so that the ultimate product:

- Is compatible with and complementary to the plans of other conservation property managers in the BRBNA.
- Directs the coordinated management of the Wildlife Area with other public and private conservation property managers.
- Directs appropriate management coordination with adjoining private property owners.

The Integrated Planning Program incorporated two components:

- Initial meetings between Department and University staff and appropriate staff of BLM and BOR to identify specific opportunities for coordinated planning and management. Also, the University staff members involved in the preparation of this plan were simultaneously developing a management plan for the McLaughlin Reserve. The Natural Reserve System and Department of Fish and Game have already established a precedent for cooperative management with a joint plan for tamarisk eradication along Knoxville Creek. To the greatest extent possible, the management plans for the KWA and McLaughlin Reserve will have consistent and complimentary management policies and practices.
- Ongoing project updates to the BRBNA Conservation Partnership, with a request for specific input as to integration of planning efforts and coordination of ongoing management.

Science and analysis—Scientific data to guide this Plan came from a variety of sources including existing natural and cultural resource inventories, additional surveys for rare plants and animals, non-native invasive plants, and historically significant sites, and a review of the scientific literature covering relevant management issues (e.g., the effect of grazing on grassland species composition and the effect of bicycling on native plant cover and soil movement). In addition, an interview was conducted with George Gamble, a previous owner of the KWA, to glean information about past human impacts and management practices in the area.

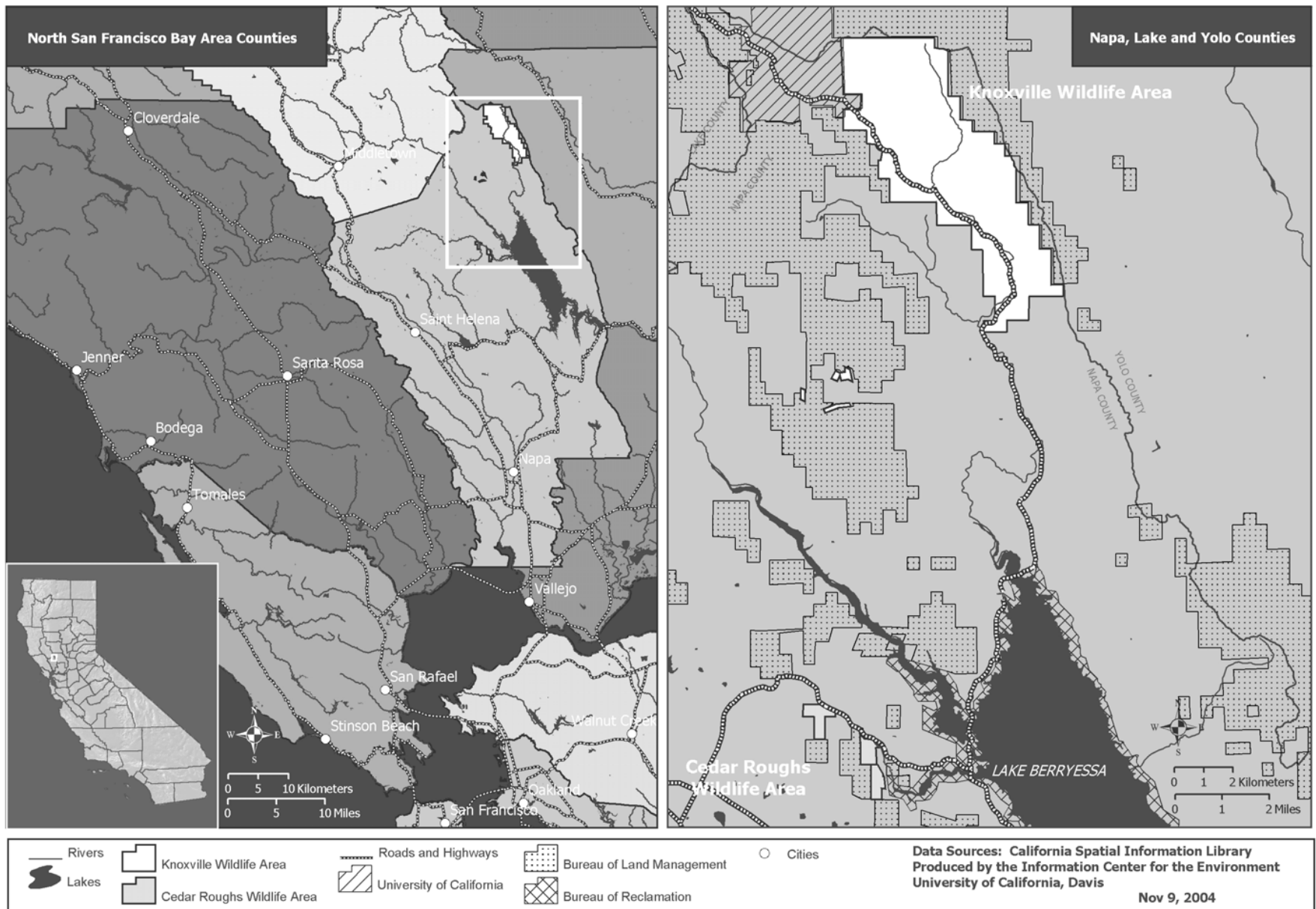
The most valuable natural resource inventory in existence prior to the start of the planning process was a new digital vegetation map of Napa County based on the Manual of California Vegetation Classification (Sawyer and Keeler-Wolf 1995, Thorne et al. in press). This map was used to identify likely areas where sensitive species or invasive species might occur and was used to guide all additional survey efforts in the Wildlife Area. Besides the vegetation map, existing information about the occurrence of plant and animal species of the KWA was sparse. Information was limited to a few

records in the Department's California Natural Diversity Database and a personal plant list maintained by a member of the Napa Chapter of the California Native Plant Society. Species occurrence records for the KWA were supplemented with inventory data for the McLaughlin Mine property (currently the McLaughlin Reserve), which abuts the KWA to the northwest. These data include baseline surveys for plants and animals conducted in the early 1980's as well as ongoing monitoring of sensitive plants and animals.

No formal archaeological surveys had been conducted prior to the start of the planning process, although the Department had compiled an inventory of potentially significant sites based on observations of Department personnel. As part of the planning process, the Anthropological Studies Center of Sonoma State University was contracted to conduct limited cultural resource surveys at the KWA. These surveys focused on areas that would be affected by recurring maintenance of access roads and on areas that were slated for starthistle control.

University of California staff members and subcontractors conducted targeted biological surveys to fill key gaps in previously existing inventory data. These surveys focused on the following areas: the distribution of sensitive plants, the distribution of non-native invasive plant species, the distribution of remaining grasslands dominated by native species, the occurrence of sensitive aquatic reptiles and amphibians, and the characterization of vegetation associated with man-made stock ponds. Methods and results for these surveys are presented in Appendix B.

Figure 1: Location of the Knoxville Wildlife Area



II. DESCRIPTION OF THE WILDLIFE AREA

❖ Geographic Setting

The Knoxville Wildlife Area consists of two discrete units. The primary unit, also known as the South Knoxville Ranch, consists of approximately 8080 acres at the northeastern end of Napa County and encompasses much of the upper watershed of Eticuera Creek which originates in Long Canyon, then flows out to Berryessa-Knoxville Road, where it is joined by Knoxville Creek, and the runoff from Foley Creek. A much smaller secondary unit, known as Adams Creek, consists of three irregularly-shaped parcels totaling 92.5 acres located about 3.25 miles southwest of the southern tip of the primary unit. These parcels are located near Adams Creek within or adjacent to public lands administered by the Bureau of Land Management. The northernmost parcel is referred to as the Adams Creek Parcel because it lies along Adams Creek. The westernmost parcel is referred to as the Turner Mountain parcel because it lies just south and east of Turner Mountain. The southernmost parcel is referred to as the Blue Monday Mine Parcel because it lies about a mile east of the Blue Monday Mine.

The South Knoxville Ranch lies along Berryessa-Knoxville Road about 6 miles north of the northern end of Lake Berryessa. Berryessa-Knoxville Road runs between Highway 128, southwest of Lake Berryessa, and the intersection of Highways 29 and 53 in the town of Lower Lake in Lake County. Within Lake County, Berryessa-Knoxville Road is known as Morgan Valley Road. The Adams Creek unit is not easily accessible by vehicle. The nearest road to the parcels is an unnamed dirt road that branches off of Devilhead Road then follows Adams Ridge and crosses Adams Creek. This road is maintained by the Bureau of Land Management, and was not open for vehicular access at the time of this writing.

Both units of the KWA are within an area of hilly to mountainous terrain west of the Blue Ridge, which borders the Sacramento and Capay Valleys. Elevations range from a low of about 750 feet to a high of 2600 feet near the Blue Ridge (Figure 2). The South Knoxville Ranch can be found on the USGS 7.5 minute Knoxville quadrangle map; Township 11 North, Range 4 West, Sections 4, 5, 9, 15, 16, and 26; and portions of Sections 3, 8, 10, 11, 14, 17, 21, 22, 23, 24, 25, 27, 35, and 36; and a portion of Township 12 North, Range 4 West along the border of Napa and Yolo Counties (Figure 3). The Adams Creek Unit can be found on the USGS 7.5 minute Walter Springs quadrangle map within Township 10 North, Range 4 West, Sections 6 and 7 and Township 10 North, Range 5 West, Sections 1 and 12.

The Department obtained the Adams Creek unit of the Knoxville Wildlife Area as a donation from Que Pasa Corporation in 1989. At the time, the purpose of the acquisition was not specified, and because of the small size, isolation and inaccessibility of the parcels, they have not been actively managed. They are, in effect, managed under the umbrella of the BLM's Knoxville Recreation Area, and consequently the

remainder of this Plan will focus on the South Knoxville Ranch and use the term Knoxville Wildlife Area synonymously with the South Knoxville Ranch. Sensitive plant surveys did include the Adams Creek unit although no other biological surveys did. Sensitive plants that occur only in the Adams Creek unit are so indicated in Chapter III.

❖ **Acquisition of the Wildlife Area**

The primary purpose for acquiring the South Knoxville Ranch, as outlined in the Department's Land Acquisition Evaluation, was to protect grasslands and oak woodlands and to restore the riparian habitat of Elicuera, Foley, Long Canyon, and Knoxville Creeks. In addition, the acquisition was viewed as advancing the goals of the Blue Ridge-Berryessa Natural Area (BRBNA) Conservation Partnership, a consortium of landowners, land managers, and other parties interested in protecting the natural resources of the Putah and Cache Creek watersheds. The South Knoxville Ranch Land Acquisition Evaluation proposed that the Knoxville Wildlife Area would be managed cooperatively with neighboring BRBNA partners under the umbrella of a Coordinated Resource Management Plan for the entire 300,000-acre region.

The South Knoxville Ranch was purchased from Homestake Mining Company of California on July 27, 2000. The property was appraised for \$2,425,000, and Homestake Mining Company agreed to sell for \$2,200,000, resulting in a donation to the state of \$225,000 in land value. The purchase was funded from a combination of sources: (1) a grant by the David and Lucille Packard Foundation to the Land Trust of Napa County for \$902,000, (2) a donation by the Bechtel Family Foundation of \$20,000, (3) a donation by the San Francisco Foundation (Evelyn Tilden Mohrhardt Fund) for \$50,000, and (4) allocation of \$1,243,000 (the balance of the purchase price plus transaction costs) by the Wildlife Conservation Board from the Habitat Conservation Fund. The acquisition of the property was largely coordinated within the BRBNA Conservation Partnership, and was facilitated by a number of partners, including the Land Trust of Napa County, Homestake Mining Company, and the University of California.

In 1990, Homestake Mining Company purchased the entire Knoxville Ranch (9095 acres) from the Gamble brothers, Launce E. and George F., for mineral exploration. Only a small portion of the Knoxville Ranch at the northwest boundary adjacent to the McLaughlin Mine pit was mined, and during the 1990s Homestake worked with the Trust for Public Land and BLM to sell the southern portion of the Ranch to BLM via an exchange of surplus BLM parcels. A drop in gold prices forced Homestake to fast track the property's sale and initiated efforts by BRBNA partners to seek immediate funding. Homestake Mining Company retained ownership of about 1015 acres (the North Knoxville Ranch, including areas that were impacted by the McLaughlin Gold Mine and the Knoxville Mercury Mine) of the original Gamble property. In February 2003, these 1015 acres became part of the University of California McLaughlin Reserve.

❖ **Property Boundaries, Land Use, History, and Cultural Resources**

Property Boundaries and Current Land Use—The South Knoxville Ranch is bordered by the BLM Cache Creek Management Unit on the north and the east, by the UC Davis—McLaughlin Reserve on the north and west, by the BLM Knoxville Recreation Area on the west, and by a single private ranch to the west and south (Figure 1). Current uses on adjacent properties are primarily low-to-moderate intensity recreation (on BLM lands), research (at the McLaughlin Reserve), and cattle grazing (on private lands). A large portion of the BLM Cache Creek Management Unit is a wilderness study area, with few roads and no development. An unnamed BLM road passes near the north boundary of the South Knoxville Ranch. This road, which is open only during the dry season, branches off Rayhouse Road in Yolo County, runs past Fiske Lake along the ridge between Davis and Fiske Creek, and dead-ends just below Blue Ridge. This road provides access to the northern end of the South Knoxville Ranch. The BLM Knoxville Recreation Area is managed for off-highway vehicle (OHV) use, but most OHV trails are concentrated away from the border with the KWA. The UC Davis—McLaughlin Reserve, located on land that was formerly part of Homestake Mining Company's McLaughlin Mine operation, is closed to public access and is primarily used for academic teaching and research in the environmental, biological, and earth sciences.

Historical Land Use—The human history and pre-history of the KWA and the surrounding lands is typical of the inner coast range and other areas inland of the influence of Spanish missions. Native Americans occupied the area until the mid-1800s when Europeans arrived to homestead and to prospect silver and mercury. Historical records from the time of European arrival indicate that the KWA was occupied by Hill Patwin, near their boundary with the Lake Miwok to the west. The Hill Patwin were related culturally and linguistically to other Wintun speakers in the Sacramento Valley, whereas the Lake Miwok were related to the Miwok of western Sonoma and Marin Counties. The Hill Patwin occupied winter villages in open valleys along Putah and Cache Creeks. A single Hill Patwin triblet, the Topaidisel, occupied the KWA. Their principal settlement, Topai, is now beneath Lake Berryessa. The Topaidisel probably used the KWA for seasonal resource gathering.

The discovery of silver in the Napa Valley first attracted prospectors to the Knoxville Area in 1858. No silver was discovered, but in 1861, during construction of Berryessa-Knoxville Road (the first road into Lake County) mercury ore (in the form of cinnabar) was discovered at what would become Knoxville, near the northwest boundary of the KWA. The X.L.C.R. mine began operation at the Knoxville deposit in 1861. As it changed ownership, the mine was variously named Redington, Boston, and finally Knoxville, in honor of Ranar B. Knox, co-inventor of the Knox-Osbourne mercury furnace and one the original lessees that operated the X.L.C.R. mine. By 1880, the town of Knoxville had about 300 people and 50 buildings. Two other major mercury mines operated within a few miles of the KWA. The Manhattan mine (about a mile west of the KWA) opened in 1869 and at least four mines (later consolidated as the Reed

Mine) operated above Davis Creek (about two miles northwest of the KWA) in the late 1800s.

The Knoxville Mine operated until the 1970s, although production varied with fluctuations in the mercury market. Mercury mining had substantial impacts on the KWA and the broader region. Homesteaders were attracted to the area by the presence of the mine, which provided a market for produce, meat, and oak firewood to fuel furnaces that were used to drive elemental mercury out of the ore. Ore processing required a substantial supply of firewood (more than a cord of wood to fuel a single furnace for 24 hours), and the area around Knoxville is noticeably devoid of woody vegetation. It is likely that substantial oak clearing occurred throughout the KWA to support the operations at Knoxville.

Beginning around 1927, the Gamble family began buying up homesteads within the KWA, and eventually consolidated up to 18 homesteads into the "Knoxville Ranch" which included the Knoxville mine and town site. The Gambles used the ranch to run their herd of 400 cattle, and also continued to work the mine on and off. To improve their rangeland, the Gambles removed oaks from 2000 to 4000 acres of the Knoxville Ranch, including some areas that were completely cleared. In 1976 George Gamble closed the mine for the last time, and several years later razed what remained of the mine and the town because of looting and squatting. The old furnaces and piles of calcine (roasted ore) were buried.

In 1981, Homestake Mining Company bought the nearby Manhattan Mine after discovering an economic gold deposit in the same geologic formation that had produced mercury ore. Homestake dug an open pit mine at the site of the Manhattan Mine, and named the new operation the McLaughlin Mine. The McLaughlin pit was adjacent to the Knoxville Ranch, and in 1992 Homestake bought the Knoxville Ranch from the Gamble family in order to expand the pit. In 2000, Homestake sold the South Knoxville Ranch to the Department (they retained the mineral rights), and kept the North Knoxville Ranch, which included a portion of the McLaughlin pit, the Knoxville Mine, and most of the Knoxville town site. Excavation at the pit ceased in 1996, and in 2002 the McLaughlin Mine was decommissioned and torn down. Reclamation activities are ongoing as of this writing. Also in 2002, Homestake Mining Company (by then a subsidiary of Barrick Gold Corporation) signed an agreement with the University of California allowing the University to manage the property as a unit within its statewide Natural Reserve System. The Homestake property is currently managed by UC Davis as the McLaughlin Reserve, its primary function to serve as an outdoor laboratory for academic teaching and research.

Cultural Resources—Two recent cultural resource surveys have occurred at the KWA, both conducted by Anthropological Studies Center of Sonoma State University. The first occurred in 2001, and was limited to a survey of 3 one-acre proposed parking lots along Berryessa-Knoxville Road (Haydu 2001). The second occurred in 2003, and focused on areas most likely to be impacted by management activities. These include about 15 miles of old ranch roads in Long and Foley Canyons that are maintained for

foot traffic and several areas in Foley Canyon that were proposed for immediate starthistle control (Haydu 2004). This latter study included a search of records and literature of previous cultural resource surveys in and around the KWA, and an interview with George Gamble, former owner of the Knoxville Ranch. Resources cataloged during these surveys include historic-period roads, isolated prehistoric pestles, mortars, and scatters of stone tools, an historic-period camp site occupied by Lester Dino, who patrolled the ranch from the 1940's through the 1960's, and a windmill/windpump constructed during the 1930s. Conclusions and recommendations from the two recent cultural resource surveys are summarized in Chapter VI.

In addition to these cataloged resources, other historical sites and artifacts have been noted by Department staff members. These include the remains of the Knoxville cemetery (with headstones dating to the 1870s), roadbeds and other ground disturbances associated with the Knoxville town site, and the hand-hewn stone foundations of three 10 to 15-foot diameter lime kilns. According to Dean Enderlin, former geologist and environmental manager for the McLaughlin Mine, these kilns probably operated briefly in the 1870s.

❖ **Geology, Soils, Climate, Hydrology**

Geology—Geology explains much of the diversity of soil, vegetation, hydrology, and wildlife habitat that occurs within the Knoxville Wildlife Area. The geologic history of the KWA can be traced back to the late Jurassic and Cretaceous periods (140 to 100 million years ago) when the oceanic Farallon plate was being subducted under the western margin of the North American continent. This event was responsible for much of the formation of California's Coast Range as well as the Sierra Nevadas. The Farallon plate consisted of oceanic crust extruded from mid-oceanic spreading centers. As molten rock crystallized from these spreading centers they formed an ordered series of rocks that included peridotite at the base, gabbro, and basalt at the top. This series is collectively known as the Coast Range Ophiolite. Peridotite is rich in iron and magnesium (ultramafic), and under exposure to seawater magnesian silicates become hydrated to form serpentine. Much of the peridotite in the Coast Range Ophiolite was subsequently metamorphosed into serpentine.

As the Farallon plate descended beneath the North American Plate it produced a series of volcanoes, similar to the present day Cascade Range. The magma that remained beneath these volcanoes cooled slowly at depth to produce the granitic Sierra Nevada Batholith. As the ancient Sierra Nevada weathered layers of sediment were deposited in an ocean basin at the continental margin. These layers are known as the Great Valley Sequence.

About 30 million years ago, the spreading center behind the Farallon plate collided with the North American Plate. This brought a new oceanic plate—the Pacific Plate—into contact with the continental plate, and formed the Mendocino Triple Junction, where the continental plate, the Pacific Plate, and the remains of the Farallon plate came into

contact. North of the triple junction, subduction continues as the remains of the Farallon Plate (the Juan de Fuca Plate) descend below the continent, but south of the junction subduction was replaced with lateral movement between the continental and Pacific plates. As the jagged edges of the two plates slid laterally, localized centers of extension and compression became centers of volcanic activity and uplift (via thrust faults), respectively. This shift to lateral movement caused formation of the San Andreas Fault system and uplift of the Coast Range in the vicinity of the KWA about 5 million years ago.

The Stony Creek Fault bisects the KWA, roughly along the path of Berryessa-Knoxville Road. Although now part of the San Andreas system, the Stony Creek Fault may have originated in the Cretaceous as a north-trending fault in which Great Valley sediments were thrust over Coast Range Ophiolite. As a result of the Stony Creek Fault, rocks to the east of Berryessa-Knoxville Road in the KWA are mostly sedimentary (sandstones and siltstones), whereas those to the west are largely serpentine and peridotite derived from the Coast Range Ophiolite. Beginning roughly two million years ago volcanic activity occurred along the Stony Creek Fault in the vicinity of the KWA. This activity created hydrothermal systems, which brought mercury and gold-depositing waters to the surface. These hydrothermal systems are responsible for the gold and mercury deposits at the Knoxville, Reed, and Manhattan Mines.

Relative to most rocks from the continental crust, serpentine is rich in magnesium and iron, and sometimes nickel, cobalt, and chromium. It is poor in calcium, silica, potassium, and sodium. As a consequence many plants are unable to grow on serpentine. Those that do often have reduced stature, and serpentine plant communities are typically sparse. Serpentine substrates also support a large number of endemic species that have evolved mechanisms to tolerate the harsh growing conditions, but frequently are unable to compete with other species when growing off of serpentine. Within the KWA, plant communities growing on serpentine have distinctly different composition and structure from communities growing on sedimentary substrates.

Soils—Soils in Napa County were mapped by the USDA Soil Conservation Service (now the Natural Resources Conservation Service) in 1965 through 1973 and published in August 1978. Soil names and descriptions that follow are taken from this map (Appendix C).

To the east of Berryessa-Knoxville Road, soils are mostly a complex of the Bressa and Dibble Series. These soils are derived from the sandstone and shale of the Great Valley Sequence and occur on moderately steep (15-30 %) to steep (30-50 %) slopes. In a representative profile of the Bressa series, the surface layer is pale brown, slightly acid silt loam 10 inches thick. The subsoil is light yellowish brown and yellowish brown, slightly acid and medium acid silty clay loam 23 inches thick. Weathered, soft sandstone is at a depth of 33 inches. In a representative profile of the Dibble series, the surface layer is pale brown and brown, slightly acid silty clay loam 9 inches thick. The subsoil is brown and yellowish brown, slightly acid silty clay and clay 25 inches thick. Weathered

sandstone is at a depth of 34 inches. The plant cover on these soils is mostly scattered oaks and annual grasslands.

Moving east across the KWA, the Bressa-Dibble complex gives way to the Maymen-Millsholm-Lodo association and rock outcrops on the steep slopes just below the crest of Blue Ridge. This association consists of steep and very steep soils on hills mainly in the northern part of Napa County bordering Yolo County and extending southward to Lake Berryessa. The Maymen soils in this association are in convex areas on north-facing slopes of mainly 30 to 75 percent. The Millsholm soils are in convex areas on south-facing slopes of mainly 50 to 60 percent near ridge peaks. The Lodo soils are in convex areas on south-facing slopes of mainly 30 to 75 percent.

The Maymen-Millsholm-Lodo association is about 50 percent Maymen soils, 20 percent Millsholm soils, 20 percent Lodo soils, and 10 percent Rock outcrop. All of these soils are considered well or excessively drained and are highly prone to erosion. They are derived from sandstone and shale, and support vegetation that consists primarily of chamise, manzanita, scrub oak, and small trees in protected areas.

In a representative profile of a Maymen soils the surface layer is pale brown, medium acid gravelly loam 6 inches thick. The subsoil is light yellowish brown, strongly acid gravelly loam 6 inches thick. Fractured sandstone is at a depth of 12 inches. In a representative profile of a Millsholm soil the surface layer is pale brown, medium acid loam 4 inches thick. The subsoil is yellowish brown, medium acid clay loam. Sandstone is at a depth of 12 inches. In a representative profile of a Lodo soil the surface layer is brown, neutral loam 4 inches thick. The subsoil is brown, neutral heavy loam 3 inches thick. Fractured sandstone is at a depth of 7 inches.

The Diablo series is a clayey soil that occurs in the KWA only on the slopes immediately south and east of the Knoxville town site. The Diablo series are well-drained soils formed in material weathered from sandstone and shale. The plant cover is mostly annual grasses and scattered oaks. In a representative profile the surface layer is dark gray and very dark gray, acid clay 25 inches thick. The underlying material is calcareous clay 35 inches thick. It is light olive brown in the upper 12 inches and light yellowish brown in the lower 23 inches. Weathered sandstone and shale are at a depth of 60 inches.

On the west side of Berryessa-Knoxville Road, soils are mostly in the serpentine-derived Henneke and Montara series. These are shallow soils with loamy to clayey textures, little horizon development, and high gravel and rock fragment content.

Henneke soils usually support chaparral, whereas Montara soils may support grassland. In a representative profile of a Henneke soil the surface layer is reddish brown, neutral gravelly loam 7 inches thick. The subsoil is reddish brown, mildly alkaline very gravelly clay loam 8 inches thick. Fractured, greenish blue serpentine is at a depth of 15 inches. In a representative profile of a Montara soil the surface layer is grayish brown and dark grayish brown mildly alkaline clay loam underlain at a depth of 12 inches by serpentine.

Hydrology and Climate—Much of the Knoxville Wildlife Area lies within the watershed for Eticuera Creek, which in turn is within the greater Putah Creek watershed. Eticuera Creek originates in Long Canyon in the upper half of the Wildlife Area, and runs in a southerly direction out to Berryessa-Knoxville Road. There it is joined by Knoxville Creek and Foley Creek. Knoxville Creek is largely intermittent, with most stretches experiencing periods of zero flow in late summer. The stretch of Knoxville Creek in Township 11 North, Range 4 West, Section 16 may maintain a low level of flow year round because of input from nearby springs in serpentine substrates. Outcrops of serpentine characteristically contain springs and seeps, many of which have year-round flow.

The hydrology and water quality of the upper Knoxville Creek watershed was characterized by D'Appolonia Consulting Engineers, Inc. in the early 1980s as part of the environmental review process for permitting the McLaughlin mine. D'Appolonia summarized the hydrology of Knoxville Creek as follows:

"The hydrology of the Knoxville drainage is dominated by steep terrain and thin and poorly porous soils. The limited catchment area of the Knoxville drainage is reflected in the total suspended solids load of the stream; a heavy rainfall/runoff prompts an increase of total dissolved solids (more soil exposed to prolonged leaching). Low flow periods or stagnation reduce the total suspended solids load considerably."

The water quality of Knoxville Creek is affected by the complex geology of the drainage system as well as by the past operation of mercury mines (Manhattan and Knoxville) in the watershed. The chemistry of the surface water reflects the surrounding geology: high content of sodium and magnesium salts derives from serpentine in the watershed, and high concentrations of sodium, chloride, fluoride, arsenic, boron, manganese, and mercury arise from leaching of hydrothermal deposits. These natural inputs have undoubtedly been exacerbated by the operation of the Manhattan and Knoxville mines, which exposed freshly extracted rock to accelerated leaching. With the construction of the McLaughlin Mine in the early 1980s any sediment or water input to Knoxville Creek from the Manhattan Mine ceased. Homestake installed a pump back system to contain any runoff from the McLaughlin mine before it could enter Knoxville Creek. In 1999, Homestake built a similar system to contain any runoff from the historic Knoxville mine.

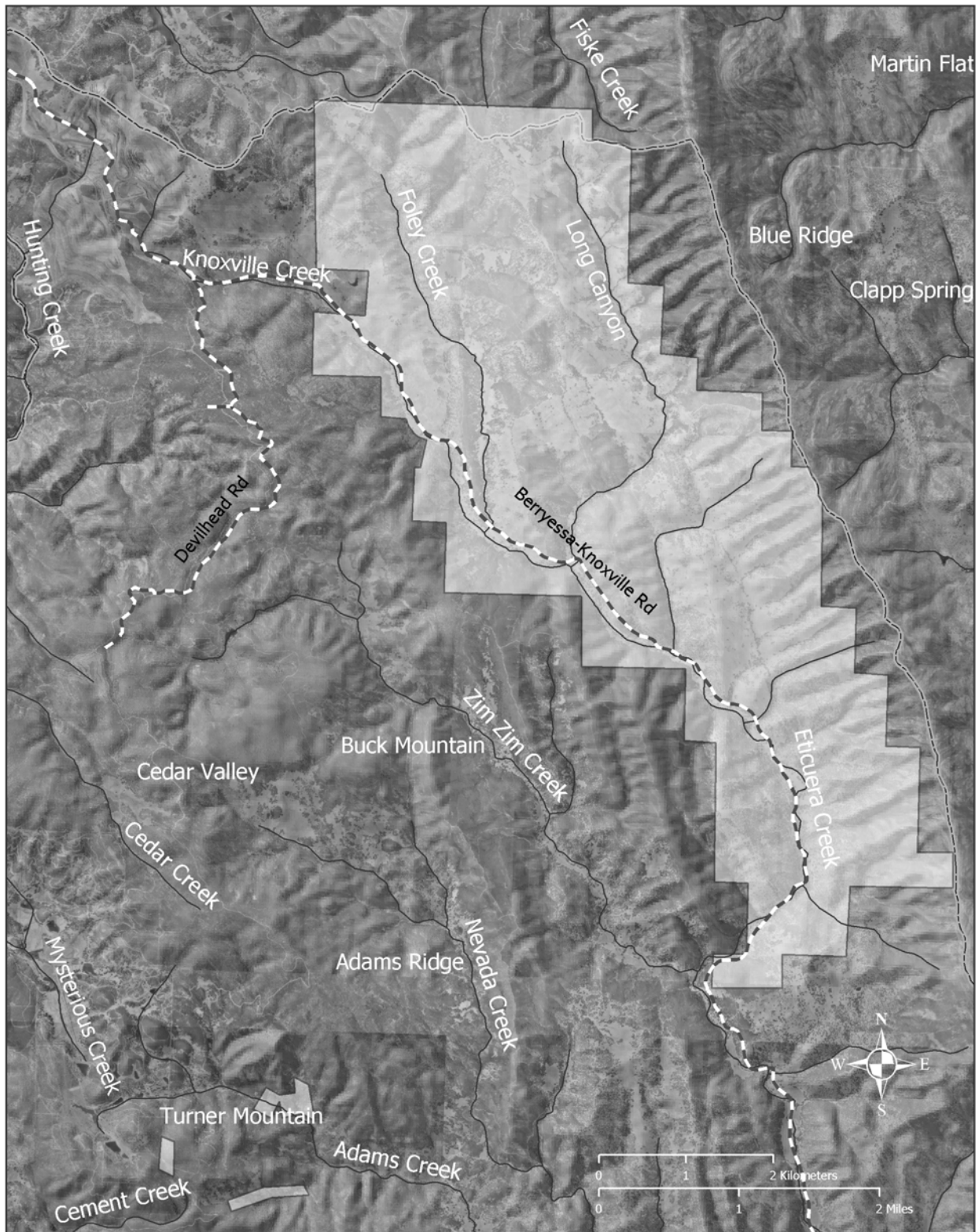
Water quality in Knoxville Creek has been monitored at least annually since 1982 by Homestake Mining Company at a site (KC 3) on the McLaughlin Reserve upstream of the KWA. This site is downstream of the McLaughlin mine, but upstream of the Knoxville mine site. These data show no obvious trends in any of the measured parameters (alkalinity/hardness, TDS/specific conductance, chloride, ammonia, sulfate, arsenic, boron, calcium, chromium, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, sodium, zinc, flow/TSS).

During the ranching period, numerous impoundments were constructed at the KWA for watering livestock. A map of water developments on the South Knoxville Ranch

contained in a 1993 appraisal of the property indicates that more than 20 such impoundments exist. Most of the reservoirs produced by these impoundments are small and seasonally dry. During the period that it owned the property, Homestake Mining Company obtained the water rights for three of these reservoirs, with a total volume of 1.7 acre feet (Appendix D). These rights were transferred to the Department along with ownership of the property.

The KWA has a typical Mediterranean climate, with hot, dry summers, and most precipitation occurring as rain in the winter. The nearest weather stations to the KWA are at the McLaughlin Reserve. As of the end of the 2000/2001 rainy season, the 17-year average for precipitation of the Reserve was 26.39 inches. The Soil Survey of Napa County estimates annual precipitation in the vicinity of the KWA at 25 to 30 inches.

Figure 2: Knoxville Wildlife Area depicted on U.S. Geological Survey digital orthophoto quarter quads taken in 1993

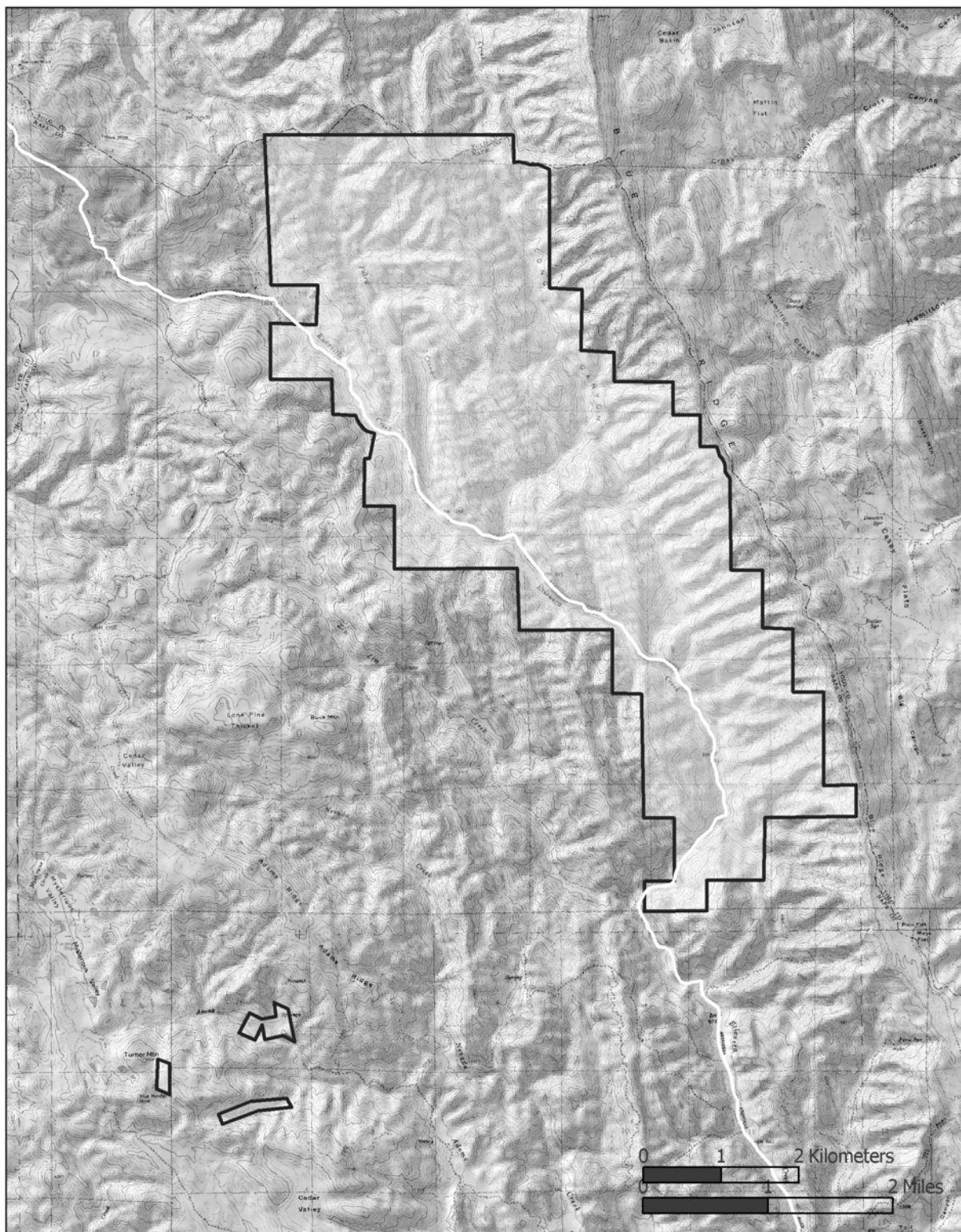


- - - Roads
 — Streams

Data Sources: California Spatial Information Library
 Produced by the Information Center for the Environment
 University of California, Davis

Dec 13, 2004

Figure 3: Knoxville Wildlife Area depicted on U.S. Geological Survey 1:24K quad maps (Knoxville and Walter Springs Quads)



Data Sources: California Spatial Information Library
Produced by the Information Center for the Environment
University of California, Davis

December 16, 2004

III. VEGETATION, HABITAT, AND SPECIES DESCRIPTIONS

❖ Vegetation

Vegetation at the KWA is determined largely by geology. Areas with soils derived from serpentine and other ultramafic rock have plant species and vegetation types distinct from areas with soils derived from sedimentary rock. Serpentine substrates are home to many plant species that are serpentine endemics—that is they occur only on serpentine. Because of the limited distribution of serpentine, many of these endemics are rare or are species of special concern. While less than 10% of the substrate on the KWA is derived from serpentine, this area is where most plant species of special concern occur.

A vegetation map based on A Manual of California Vegetation (Sawyer and Keeler-Wolf 1995) was recently published for Napa County (Thorne et al. in press), and this map is used as the basis for describing vegetation at the Knoxville Wildlife Area (Figure 4). The Manual of California Vegetation (MCV) is published by the California Native Plant Society and is the result of an effort to develop a consensus classification for floristic (as opposed to physiognomic) descriptions of California vegetation. Current Department guidelines for producing management plans specify that vegetation descriptions should follow the MCV. The current MCV map for Napa County is based on U.S. Geological Survey digital orthophoto quarter quads (DOQQs) taken in 1993. These DOQQs have high resolution (one-meter pixels), which permitted minimum mapping units of one hectare or less.

The MCV classification system is hierarchical, with the highest levels (Class and Group) based on vegetation physiognomy (plant growth form, leaf type, seasonality) and lower levels (Super-alliance, Alliance, and Association) based on the floristic composition of the vegetation. Most polygons within the Napa County MCV map describe an alliance, a super-alliance, or an association. The alliance (formerly referred to as a "series") is the principal unit of vegetation classification in the MCV. Alliance definitions are based on dominant or diagnostic species in the dominant vegetation stratum (e.g., the tree canopy for woodlands, the shrub layer in shrublands, and the ground layer in grass or forblands). In the DOQQ imagery used to create the Napa County MCV map, different alliances were sometimes indistinguishable leading to the formation of a super-alliance (e.g., two similar oak alliances, leading to a mixed oak super alliance). These super alliances are not formally defined (NFD) in the Manual of California Vegetation. Variation within alliances can be further described using associations (e.g., the mixed oak alliance can be subdivided into associations depending on which oak species are present). Many of the associations included on the Napa County MCV map are not formally defined in the MCV. They were included on the assumption that they will eventually be defined and incorporated in the MCV.

The Napa County MCV map identifies 23 cover types within the Knoxville Wildlife Area (Table 1), of which 20 are defined by floristics, and three (rock outcrop, agriculture, and open water) are not. Within the KWA, 15 polygons totaling 55 acres could not be classified from the DOQQ imagery; these are labeled “unknown” on the map. Dominant vegetation alliances or super alliances in the KWA include annual grassland, blue oak woodland, mixed and interior live oak woodland, chamise and chamise-wedgeleaf ceanothus shrubland (chaparral), and interior live oak - scrub oak shrubland (chaparral). Corridors along Knoxville and Eticuera Creeks as well as creeks in Foley Canyon and Long Canyon are dominated by a valley oak alliance. Serpentine areas on the west side of Berryessa-Knoxville Road and in the Adam's Creek unit are dominated by four shrubland alliances, collectively known as serpentine chaparral, as well as serpentine grasslands. A mixed willow super alliance occurs in the upper reaches of Knoxville Creek.

Table 1. Cover types described in the Napa County MCV vegetation map that occur within the Knoxville Wildlife Area.

Group	Map Code	Alliance/Super Alliance	Association	Total Acres	Per-cent
Xeromorphic sclerophyll woodlands	1222	Interior live oak alliance		300	3.76
	1223	Mixed oak alliance		152	1.91
	1202	Mixed oak alliance	Interior live oak – blue oak – (foothill pine) NFD association	1378	17.26
Evergreen needle-leaf forests & woodlands	2128	Sparse California juniper – canyon live oak – California bay – California buckeye / steep rock outcrop NFD alliance		38	0.48
	2104	Foothill pine alliance	Foothill pine / mesic non-serpentine chaparral NFD association	12	0.16
Cold season deciduous forests & woodlands	3121	Black oak alliance		48	0.61
	3122	Blue oak alliance		1271	15.92
	3123	Valley oak alliance		15	0.19
	3101	Valley oak alliance	Valley oak – (California bay – coast live oak – walnut – ash) riparian NFD association	260	3.26
	3221	Mixed willow super alliance		10	0.13
Sclerophyllous evergreen shrubland (chaparral)	4301	Scrub interior live oak – scrub oak – (California bay – California ash – Birch leaf mountain mahogany – toyon – California buckeye) mesic east county NFD super alliance		645	8.08
	4303	Leather oak – white leaf manzanita – chamise xeric serpentine NFD super alliance		138	1.73

Vegetation, Habitat, and Species Descriptions

	4304	Leather oak – California bay – <i>Rhamnus</i> spp. mesic serpentine chaparral NFD alliance		42	0.53
	4305	White leaf manzanita – leather oak – (chamise – <i>Ceanothus</i> spp. (foothill pine)) xeric serpentine NFD super alliance		74	0.93
	4306	California bay – leather oak – (<i>Rhamnus</i> spp. (foothill pine)) mesic serpentine NFD super alliance		6	0.48
	4321	Chamise alliance		1221	15.30
	4322	Chamise – wedgeleaf ceanothus alliance		448	5.62
Perennial herbaceous	6403	(<i>Carex</i> spp. – <i>Juncus</i> spp. – wet meadow grasses) NFD super alliance		<1	0.01
Annual herbaceous	7120	California annual grassland alliance		1786	22.38
	7130	Serpentine grassland NFD super alliance		41	0.52
Non-vegetated	9001	Rock outcrop		<1	<0.01
	9200	Agriculture		1	0.02
	9400	Water		<1	0.01
Unknown	9999			55	0.70
TOTAL				7986	100

Interior live oak alliance—The interior live oak alliance is defined by having interior live oak (*Quercus wislizenii*) as the sole or dominant tree in the canopy. At the KWA, interior live oak rarely occurs as the sole component of the canopy. It is usually mixed with a minor component of blue oak (*Q. douglasii*) and foothill pine (*Pinus sabiniana*) and often grades into a mesic chaparral (code 4301). At the KWA, the interior live oak alliance occurs on sedimentary substrates to the east of Berryessa-Knoxville Road, primarily on moderately steep to steep north facing slopes.

Mixed oak alliance—The mixed oak alliance is mapped at the KWA both at the alliance and the association level. Areas mapped as 1223 are defined as having a mixture of black oak (*Quercus kelloggii*), blue oak, coast live oak (*Q. agrifolia*), interior live oak, or valley oak (*Quercus lobata*) in the canopy. This alliance primarily occurs along streams in the upper end of Long Canyon. California bay (*Umbellularia californica*) and California buckeye (*Aesculus californica*) also are present in this cover type. The interior live oak – blue oak – (foothill pine) association (code 1202) is a provisional association within the mixed oak alliance that is widespread at the KWA. This cover type has interior live oak and blue oak as important components of the canopy sometimes with foothill pine. The interior live oak – blue oak – (foothill pine) association occurs on sedimentary substrates to the east of Berryessa-Knoxville Road. The mixed oak alliance (alliance and association combined) is the second most common cover type at the KWA, at nearly 20% of the total land area.

Sparse California juniper – canyon live oak – California bay – California buckeye / steep rock outcrop NFD alliance—This alliance is restricted to steep sandstone outcrops on the west face of Blue Ridge. It is defined by having a sparse cover of California juniper (*Juniperus californica*), with canyon live oak (*Quercus chrysolepis*), California bay, and California buckeye. This is the only vegetation type containing California juniper within the KWA.

Foothill pine alliance—Foothill pine is uncommon as a dominant overstory species within the KWA. It is usually a component of chaparrals or oak woodlands. Within the KWA a small area was mapped where foothill pine reaches a relative cover of 40-50%, above non-serpentine chaparral or scrubby California bay. This area was classified as a Foothill pine / mesic non-serpentine chaparral NFD association.

Black oak alliance—Black oak is rare as a dominant cover type within the KWA. Forty-eight acres near the top of Long Canyon were classified as having black oak as the dominant tree in the canopy.

Blue oak alliance—The blue oak alliance is defined by having blue oak as the sole or dominant tree in the canopy. It is the third most common cover type at the KWA, covering almost 16% of the total land area. It is common on sedimentary substrates at the south end of the KWA and on the ridge separating Foley Creek from Long Canyon. Interior live oak may be a minor component of this cover type. At the KWA, most blue oak woodlands have sparse tree cover because of extensive clearing for range improvement.

Valley oak alliance—The valley oak alliance is mapped at both the alliance and the association level. At the alliance level (Code 3123), this cover type is defined by having valley oak as the dominant canopy species, and it almost always occurs on level to moderately sloped ground. At the KWA, this cover type occurs only along a tributary of Foley Creek near the old windmill. The valley oak – (California bay – coast live oak – walnut – ash) riparian association is a provisional association within the valley oak alliance that is more widespread at the KWA. This association occurs along the major riparian corridors of Foley Creek, Knoxville Creek, Eticuera Creek, and lower Long Canyon.

Mixed willow super alliance—The Manual of California Vegetation contains a mixed willow alliance, but in the Napa County MCV vegetation map it is considered a super alliance because in the DOQQ imagery single-species willow stands cannot be distinguished from mixed-species stands. This super alliance is defined by having one or more willow species (*Salix* spp.) important as a shrub or tree in the canopy. This cover type occurs in the KWA only along the upper reaches of the Knoxville Creek, in the heavily disturbed area around the old Knoxville town site.

Scrub interior live oak – scrub oak – (California bay – California ash – birch leaf mountain mahogany – toyon – California buckeye) mesic east county super alliance—This super alliance is a chaparral that occurs in dense stands on sedimentary

substrates. It is particularly common on steep, mesic, north-facing slopes just west of the crest of Blue Ridge, where it typically occurs just upslope of interior live oak woodlands. The cover type is defined by having interior live oak and scrub oak (*Quercus berberidifolia*) as important components of the shrub canopy. Other shrubs and trees that may be present include California bay, California ash (*Fraxinus dipetala*), birch leaf mountain mahogany (*Cercocarpus betuloides* var. *betuloides*), toyon (*Heteromeles arbutifolia*), and California buckeye.

Chamise alliance—This alliance is a type of chaparral defined by having chamise (*Adenostoma fasciculatum*) as the sole or dominant species in the shrub canopy. This type is widespread at the KWA, where it occurs mostly on xeric, non-serpentine slopes. This alliance occurs in dense stands, with 70-80% relative cover of chamise.

Chamise – wedgeleaf ceanothus alliance—This alliance is a type of chaparral defined by having chamise and wedgeleaf ceanothus (*Ceanothus cuneatus*) as important shrubs in the canopy. It also occurs on xeric, non-serpentine slopes and often intergrades with the chamise alliance.

Leather oak – white leaf manzanita – chamise xeric serpentine super alliance—This form of chaparral is restricted to xeric serpentine soils west of Berryessa-Knoxville Road. It is defined by having leather oak (*Quercus durata*), white leaf manzanita (*Arctostaphylos viscida*), and chamise as important components of the canopy, and may also include foothill pine at less than 5% cover.

Leather oak – California bay – *Rhamnus* spp. mesic serpentine chaparral alliance—This form of chaparral occurs in more mesic settings in the serpentine soils west of Berryessa-Knoxville Road, typically on concave north-facing slopes. It is defined by having leather oak, California bay, and hoary coffeeberry (*Rhamnus tomentella*) as important components of the canopy.

White leaf manzanita – leather oak – (chamise – *Ceanothus* spp. (foothill pine)) xeric serpentine super alliance—This chaparral is common on xeric serpentine sites west of Berryessa-Knoxville Road. It contains leather oak as an important component of the canopy usually with chamise and Jepson's ceanothus (*Ceanothus jepsonii*). Foothill pine also occurs, usually at less than 5% cover.

California bay – leather oak – (*Rhamnus* spp. (foothill pine)) mesic serpentine super alliance—This chaparral typically forms transitions with the white leaf manzanita – leather oak – (chamise – *Ceanothus* spp. – (foothill pine)) xeric serpentine super alliance, but occurs in more mesic, north-facing conditions. It contains California bay and leather oak as important components of the canopy, also with hoary coffeeberry, and less than 5% cover of foothill pine.

(*Carex* spp. – *Juncus* spp. – wet meadow grasses) NFD super alliance—This type, dominated by sedges and rushes, occurs in and around the margins of most stock ponds at the KWA. Many of these areas were too small to map.

California annual grassland alliance—California annual grasslands are the most common cover type at the KWA, covering over 22% of the total land area. This herbaceous cover type occurs on non-serpentine substrates where shrubs and trees make up less than 10% of the emergent cover. Non-native annual grasses and herbs are dominant in the ground layer. At the KWA, annual grasslands are dominated by Mediterranean annual grasses such as oat grass (*Avena fatua* and *Avena barbata*), medusa head (*Taeniatherum caput-medusae*), soft chess (*Bromus hordeaceus*), rip-gut brome (*Bromus diandrus*), wild rye (*Lolium multiflorum*), and rattail fescue (*Vulpia myuros*). Non-native forbs, such as yellow starthistle (*Centaurea solstitialis*), black mustard (*Brassica nigra*), filaree (*Erodium cicutarium* and *E. botrys*), bur clover (*Medicago polymorpha*), and Italian thistle (*Carduus pycnocephalus*) may also occur.

California annual grasslands may also contain native perennial grasses, especially needlegrass (*Nasella* spp.). Significant stands of needlegrass occur within the KWA, but these are not mapped separately in the Napa County MCV vegetation map because they are indistinguishable from non-native grasses on the DOOQ imagery.

Serpentine grassland super alliance—This cover type is mapped where grasslands (less than 10% shrub and tree cover) co-occur with serpentine soils. Serpentine grasslands may support a plant community with a high composition of native grasses and forbs. The proportion of native species in serpentine grasslands in the vicinity of the KWA is about 80% compared to 40% in non-serpentine grasslands (Harrison 1999?). Native grasses common in serpentine grasslands include purple needlegrass (*Nassella pulchra*), squirreltail (*Elymus elymoides*), bluegrass (*Poa secunda*), and onion grass (*Melica* spp.). Common forbs include clarkia (*Clarkia purpurea* and *C. gracilis*), birds-eye gilia (*Gilia tricolor*), goldfields (*Lasthenia californica*), and mariposa lily (*Calochortus luteus*, *C. superbus*, and *C. vestae*).

Rock outcrop—This cover type is defined by having less than 5-10% absolute cover of vegetation. At the KWA rock outcrops were mapped only along the sandstone bluffs at the crest of Blue Ridge. Rock outcrops (known as serpentine barrens) also occur within serpentine substrates at the KWA, but these were too small to map. Serpentine barrens are important habitat for several rare or sensitive annual or perennial herbaceous plants.

❖ Vascular Flora and Plant Species of Special Concern

Plant surveys conducted as part of this Plan focused on threatened or endangered species, rare species, or species of special concern. Surveys were conducted by Jake Rugyt on the following dates: April 15, 21, 2002; March 8, 21, 31, 2003; April 14, 22, 2003, May 24, 2003; June 21, 2003; April 10, 2004; June 19, 2004. Mr. Rugyt compiled a list of all plant species encountered on these surveys as well as on past visits to the KWA. This list is presented in Appendix E. It should not be considered comprehensive.

No state or federally listed species were found at the KWA, but two species (adobe lily and green jewel-flower) were found that are classified by the California Native Plant Society as rare, threatened, or endangered (CNPS List 1B) and 15 species were found that are classified by as having limited distribution (CNPS List 4) (California Native Plant Society 1994). List 1B species are considered rare, threatened, or endangered in California and elsewhere. All of the plants on the 1B list meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection Act) or Secs. 2062 and 2067 (California Endangered Species Act) of the Fish and Game Code and are eligible for state listing. The California Environmental Quality Act (CEQA) Guidelines Section 15380 provide that taxa that can be shown to meet the criteria for listing as endangered, threatened, or rare, will receive the same consideration during CEQA review that they would receive if they were actually listed. List 4 includes plants with limited distribution whose vulnerability to extinction appears low at this time. These species probably do not meet the eligibility requirements for state listing, but the CNPS recommends that List 4 plants be considered in the CEQA process. All List 1B plants and all but two List 4 plant found at the Knoxville Wildlife Area are endemic to or most common on serpentine substrates.

CNPS List 1B:

- ***Fritillaria pluriflora* (adobe lily)**—Perennial, geophyte. Serpentine mudflows (generally Maxwell Clay). Observed about 1 ¼ miles SE of Knoxville site near Knoxville Creek at 1150 ft elevation. Occurs in the Serpentine Grassland NFD – Super Alliance. Located in KWA and adjacent private property. 490 plants counted in KWA part of population. More extensive surveys for this species did not disclose any additional populations. Rare in Napa County, occurs in few other sites.
- ***Streptanthus breweri* ssp. *hesperidis* (green jewel-flower)**—Annual. Serpentine barrens and opening among serpentine chaparral. Observed about 0.9 mile SE of Knoxville site at 1350-1450 ft elevation. Occurs in a serpentine barren (not mapped on the Napa County MCV vegetation map due to being smaller than the minimum mapping unit) embedded in leather oak – white leaf manzanita – chamise xeric serpentine NFD super alliance at observed location. 250-300 plants counted. Not found on other barrens within ¼ mile area. May occur on serpentine further to the south but probability is low. Known from north Napa County (at least 5 sites) and south Lake County.

CNPS List 4:

- ***Allium fimbriatum* var. *purdyi* (Purdy's onion)**—Perennial, geophyte. Serpentine rock outcrops. Observed at one location; between 1350-1450 ft elevation. Occurs in a serpentine barren (not mapped on the Napa County MCV vegetation map due to being smaller than the minimum mapping unit) embedded in leather oak – white leaf manzanita – chamise xeric serpentine NFD super

alliance. 200-400 plants. Survey of other rock outcrops in the area did not disclose additional populations.

- ***Arabis modesta* (modest rock cress)**—Perennial. Among sandstone outcrops; at ridge top of Blue Ridge; at 2400 ft elevation. Occurs in mesic east county super alliance (4301), mapped as 9999 (unknown) at observed location. 5-10 plants (probably more plants; difficult terrain to survey). May occur in SE corner of KWA, in NE ¼ of section 36. This species is rare in Napa County, known from few sites along Vaca Mtns and Blue Ridge from Monticello Dam north.
- ***Astragalus clevelandii* (Cleveland's milkvetch)**—Perennial. Serpentine streams and seeps. Observed about 0.8 mi SE of Knoxville site. At least two channels contain this species at approximately 1200 ft elevation. Occurs in Brewer willow alliance; this vegetation type is not mapped for this site and is embedded in leather oak - white leaf manzanita – chamise xeric serpentine NFD – super alliance. 20-30 plants. This species may occur elsewhere in KWA, west of Knoxville Creek from the area near the confluence of Foley Creek northward. This species was observed at the Adams Creek Unit of the KWA in two separate parcels: the Blue Monday Mine Parcel at 1290 ft elevation) where it occurs in serpentine grassland NFD – super alliance, and the Adams Creek Parcel where it occurs in the Brewer willow alliance, which is not mapped at this site but is embedded in California bay – leather oak – (*Rhamnus* spp. (foothill pine)) mesic serpentine NFD super alliance.
- ***Collomia diversiloba* (serpentine Collomia)**—Annual. Serpentine barrens and openings among serpentine chaparral. Observed in at least two locations, about 0.8 miles SE of Knoxville site. Occurs in a serpentine barren (not mapped) embedded in leather oak – white leaf manzanita – chamise xeric serpentine NFD super alliance. 50-100 plants. This species is likely to occur in this and other serpentine alliances in the KWA, confined to area west of Knoxville Creek from near confluence of Foley Creek north. This species was also observed in two parcels of the Adams Creek Unit of the KWA: the Turner Mountain Parcel where it occurs in leather oak – white leaf manzanita – chamise xeric serpentine NFD super alliance; and the Blue Monday Mine Parcel where it occurs in serpentine grassland NFD – super alliance.
- ***Delphinium uliginosum* (swamp larkspur)**—Perennial. Serpentine streams, seasonal washes. Observed about 0.8 miles SE of Knoxville site. Occurs in Brewer willow alliance (not mapped on the Napa County MCV vegetation map), embedded in leather oak – white leaf manzanita – chamise xeric serpentine NFD super alliance and in California bay – leather oak – (*Rhamnus* spp.) mesic serpentine NFD – super alliance, and in serpentine grassland NFD – super alliance. At least 3 stream channels contain this species. 200-500 plants. Additional plants are likely to occur west of Knoxville Creek where these vegetation types occur.

- ***Fritillaria purdyi* (Purdy's Fritillaria)**—Perennial, geophyte. Serpentine rock outcrop or barren. Observed about 0.8 mile SE of Knoxville site. Occurs in a serpentine barren (not mapped on the Napa County MCV vegetation map) embedded in leather oak – white leaf manzanita – chamise xeric serpentine NFD super alliance. 240 plants counted. Extensive surveys did not disclose additional populations. This species occurs in confined populations on serpentine and volcanic substrates in at least 20 locations in Napa County. Also observed at the Adams Creek Unit of the KWA (Turner Mountain Parcel, UTM 556159 E / 4287306 N, at 1605 ft elevation) where it occurs in leather oak – white leaf manzanita – chamise xeric serpentine NFD super alliance. 20 plants.
- ***Helianthus exilis* (serpentine sunflower)**—Annual. Serpentine seeps and streams. Observed about 0.8 mile SE of Knoxville site. Occurs in Brewer willow alliance (too small to be mapped on the Napa County MCV vegetation map) embedded in leather oak – white leaf manzanita – chamise xeric serpentine NFD super alliance and also embedded in serpentine grassland NFD super alliance which is mis-mapped as California annual grassland alliance on the Napa County MCV vegetation map. 50-100 plants. This species may occur in other locations west of Knoxville Creek from near Foley Creek confluence north.
- ***Lomatium hooveri* (Hoover's lomatium)**—Perennial. Serpentine and non-serpentine (?) grasslands about 1.2 miles SE of Knoxville site. Five locations recorded between 1000 and 1500 ft elevation. Occurs in California annual grasslands alliance and serpentine grasslands super alliance. 100-150 plants. Survey for this species did not disclose any occurrences east of Foley Creek
- ***Malacothamnus helleri* (Heller's bush mallow)**—Shrub. Post-fire chaparral. Observed west of Knoxville Creek near confluence with Foley Creek. Population consists of one dense population surrounded by more sparsely scattered individuals. Occurs in scrub interior live oak – scrub oak – (California bay – California ash – birch leaf mountain mahogany – toyon – California buckeye) mesic east county NFD super alliance, leather oak – white leaf manzanita – chamise xeric serpentine NFD super alliance, and leather oak – California bay – *Rhamnus* spp. mesic serpentine chaparral NFD alliance. Estimated 1000 + plants. May potentially occur within these vegetation types throughout the KWA, especially on the Blue Ridge. This is, by far, the largest population this botanist has ever observed. Also observed at the Adams Creek Unit of the KWA (Adams Creek Parcel) where it occurs in California bay – leather oak – (*Rhamnus* spp. (foothill pine)) mesic serpentine NFD super alliance. 5-10 plants.
- ***Microseris sylvatica* (sylvan microseris)**—Perennial. Grassy slopes and ridge top. Observed in seven “patches” along the ridge between Foley Creek and Knoxville Creek. Occurs in California annual grasslands alliance. 225-300 plants (about ½ of total plants occur in a single patch). This ridge was extensively surveyed for additional patches without success. This species is stated as occurring on serpentine in CNPS Inventory. The presence of this taxon

and *Lomatium hooveri* on this ridge suggest some serpentine influence may be present here. This species has not been located elsewhere in Napa County.

- ***Mimulus nudatus* (bare monkeyflower)**—Annual. Barren or sparsely vegetated slopes or flat of serpentine seeps. Observed about 0.7 mile SE of Knoxville town site. Number of plants undetermined. Occurs in an unmapped patch of Brewer Willow Alliance embedded in Leather oak – white leaf manzanita – chamise xeric serpentine NFD super alliance. May occur in other locations west of Knoxville Creek from about Foley Creek north where 4303 and 7130 polygons occur.
- ***Monardella viridis* ssp. *viridis* (green coyote mint)**—Subshrub. Brushy and wooded slopes on all substrates. Observed at KWA only at the Adams Creek Unit (Turner Mountain Parcel and Blue Monday Mine Parcel) where it occurs in leather oak – white leaf manzanita – chamise xeric serpentine NFD super alliance. This species is widespread in Napa County and occurs at numerous sites. Sites and distribution are too widespread to warrant recording.
- ***Navarretia jepsonii* (Jepson's Navarretia)**—Annual. Grassy meadows or fields on serpentine. Observed at the KWA only in the Adams Creek Unit (Blue Monday Mine Parcel), at 1370 ft. Occurs in serpentine grassland NFD super alliance.
- ***Senecio clevelandii* (Cleveland's butterweed)**—Perennial. Serpentine streams and seeps. Observed about 0.8 miles SE of Knoxville site. Occurs in Brewer willow alliance (too small to appear on Napa County MCV vegetation map), embedded in Leather oak – white leaf manzanita – chamise xeric serpentine NFD super alliance. 10-25 plants. May also occur in California annual grasslands alliance and serpentine grasslands super alliance. May occur in other locations west of Knoxville Creek from confluence with Foley Creek north. Also observed at the Adams Creek Unit of the KWA (Blue Monday Mine Parcel), at 1400 ft. Occurs in serpentine grasslands super alliance here.
- ***Zigadenus micranthus* var. *fontanus* (marsh zigadenus)**—Perennial geophyte. Serpentine streams and alluvial fans. Observed about 0.8 miles SE of Knoxville site. Occurs in Brewer willow alliance (too small to be mapped on the Napa County MCV vegetation map) embedded in leather oak – white leaf manzanita – chamise xeric serpentine NFD super alliance and also embedded in serpentine grassland NFD super alliance which is mis-mapped as California annual grassland alliance on the Napa County MCV vegetation map. 10-25 plants. May occur at other sites along stream channels west of Knoxville Creek from Foley Creek confluence north and including Knoxville Creek within the valley oak Alliance (serpentine influence evident along channel).

❖ Invasive Plants

About 82% of the plant species recorded in the KWA are native to California; the rest are non-native species that have been imported, either intentionally or unintentionally, from elsewhere since European settlement. Non-native species that have the immediate potential to spread into natural plant communities are considered invasive. The impacts of invasive species on native communities include species endangerment (Wilcove et al. 1998), reductions in biodiversity (Rosentreter 1994) and wildlife habitat (Bedunah 1992), alterations to ecosystem processes such as fire frequency (D'Antonio and Vitousek 1992), and nutrient cycling and hydrology (Vitousek 1990), increases in topsoil loss (Lacey et al. 1989), alterations to soil microclimate (Evans and Young 1984), and economic impacts such as reductions in land value and livestock forage capacity (Sheley and Petroff 1999, Naylor 2000). The most severe impacts of invasive species often occur where they alter the disturbance regime, such as by increasing fire frequency (D'Antonio 2000, Levine et al. 2003).

The goal of the Department is to enhance native plant biodiversity, to reduce the abundance of existing non-native invasive species, and to prevent the establishment of new invading species. Non-native species are not distributed proportionally among vegetation types. Chaparral communities, both on and off serpentine, tend to have a low abundance of invasive species. By contrast, annual grasslands and the herbaceous layer in woodland cover types are dominated by invasive species. Grasslands on serpentine substrates tend to have less cover of invasive species compared to non-serpentine grasslands.

❖ Priority Vegetation Types and Invasive Species for Management

Because non-native invasive species and sensitive native species are not distributed uniformly among vegetation types, and because not all invasive species will be possible to control or eradicate, this Plan establishes a list of vegetation types in which prevention of future invasions and reversal of existing invasions is a high priority. In addition, Table 2 provides a "hot list" of invasive species that should currently be considered for management on the KWA.

Priority Vegetation Types—This Plan aims to protect the following plant communities from invasion and to restore them to a native-dominated state to the greatest degree possible:

1. *Serpentine plant communities.* Seeps, springs, and rock outcrops within serpentine chaparral or grasslands and serpentine grasslands themselves harbor a disproportionate share of sensitive plants at the KWA. Fortunately, these plant communities have so far been relatively resistant to invasion by non-native species.
2. *Riparian plant communities.* Riparian plant communities, particularly along Knoxville and Elicuera Creeks have been especially impacted by human

disturbance and invasion. Riparian invaders such as tamarisk, arundo, perennial pepperweed, and pampas grass have great potential to replace native riparian species, such as willows and to severely alter ecosystem function (e.g., by changing stream flow dynamics, water temperature, and habitat structure).

3. *Native bunchgrass-dominated grasslands and oak woodland understory.*

Grasslands and oak woodland understories still dominated by native bunchgrasses are rare in the California floristic province, especially on non-serpentine soils. Small patches of native grasslands occur in various locations on the KWA. Protecting these sites from new waves of invasion, and, where possible, expanding the extent is a key conservation priority.

Priority Invasive Plants—A "hot list" of actual or potential invasive species that should be considered for management was prepared by considering several factors. Invasive species (e.g., wild oats, filaree) that have been long integrated in the California flora and that are widespread and abundant were not included in the list because of the prohibitive cost that would be involved in targeting these species. In contrast, more recent invaders or species that still appear to be spreading were generally included on the list, especially those that show the potential to disrupt ecosystems or have low cost control techniques. Invasive species meeting the above criteria that occur within the greater BRBNA but have not yet established at the KWA were also included on the hot list. Threats posed by "hot-list" weeds (Table 2) present on or threatening to invade the KWA are summarized below.

- *Aegilops triuncialis* (barbed goatgrass): Barbed goatgrass is an annual grass native to Eurasia that was first recorded in California on the border of Eldorado and Sacramento counties in 1914 after cattle from Mexico were imported and pastured (Kennedy 1928). It currently occupies a widespread and expanding area of grasslands and shrublands below roughly 700 m in elevation in northern California (Peters et al. 1996).

As a result of its ability to thrive in serpentine habitats, goatgrass poses a substantial threat to the KWA's sensitive plants. Barbed goatgrass has not yet been recorded on the KWA, but has been steadily spreading in Morgan Valley and the Hunting Creek drainage to the west.

Goatgrass favors rocky, gravelly, well-drained soils, including those derived from serpentine, and thrives in open grasslands and disturbed habitats such as roadsides and pastures (Cronemiller 1928). It tends to grow larger in areas underlain by rocky, well drained soils than in mesic habitats (Kelly Lyons, personal communication). It first appears as scattered plants, and rapidly multiplies into solid patches (Peters et al. 1996). Spread can be so rapid that within 20 years, it can expand from a single infestation to dominance of a ranch (Peters et al. 1996). Spread may occur when its barbed awns allow seeds to be dispersed in the coats of livestock and wildlife, in clothing, and in vehicle undercarriages (Talbot and Smith 1930). Currently, the range of goatgrass is

believed to be expanding northward in California, with new infestations reported annually and existing infestations continuing to expand (Peters et al. 1996).

The life cycle of barbed goatgrass begins when it germinates following the first fall rains. It flowers between April and June, and sets seed by late June, though this pattern may vary depending on the precipitation and temperature of a given season (Peters et al. 1996). It matures later than most other annual grasses of the California floristic province. As a result, its reddish-purplish heads can be easily distinguished in the field during late spring (Peters et al. 1996). Goatgrass is characterized by rapid rates of root and shoot growth, deep penetrating roots and low palatability to livestock (Peters et al. 1996). It exhibits relatively low rates of seed production, producing only 5-9 seeds per plant (Cronmiller 1928). Most seeds germinate in the first year after seedfall, but may remain dormant in the soil for up to 5 years (Peters et al. 1996).

- *Arundo donax* (arundo, giant reed): Arundo is a tall, perennial, cane-like grass that is very fast growing (up to 5 cm per day) and reaches heights of 2 to 8 meters. It grows from creeping rootstocks that form compact masses. Possibly native to eastern Asia, it was introduced to warmer areas of the United States and the world as an ornamental and for production of reeds for musical instruments. Arundo grows in wet sites but is capable of extending beyond the normal zone of riparian vegetation. Arundo does not occur within the KWA, but is found around Lake Berryessa and along Putah Creek.

Arundo has seriously invaded most southern California waterways, forming monospecific stand over tens of thousands of acres. In northern California it is widespread but has so far been less prone to replacing native vegetation over entire waterways. Arundo threatens healthy ecosystem function because it can form vast monospecific stands that replace all native riparian vegetation. These monospecific stands provide habitat for few if any native animals. Arundo also burns easily, but is not killed by fire, so it can increase the frequency of large wildfires in riparian areas. Large volumes of biomass can break loose during flood events damaging bridges and other man made structures.

Arundo can potentially reproduced by both sexual and asexual means. It flowers between March and September, but it is uncertain how much reproduction occurs by seed. Most reproduction is thought to occur from fragmented and transported rootstock. Arundo can be controlled by a combination of mechanical and chemical means, but control efforts must take place on a watershed scale with removal starting at the upper tributaries of the watershed and moving downstream.

- *Brachypodium distachyon* (purple false brome): Purple false brome is an annual grass native to Eurasia that is only now beginning the invade grasslands near the KWA. It has already invaded the Gamble Ranch and grasslands along the west shore of Lake Berryessa. It favors warm, south-facing slopes on rich soils,

particularly in oak savannahs and the margins of oak woodlands. Purple false brome does not appear to have yet invaded the KWA. Susceptible habitats include the non-serpentine grasslands and oak woodlands. Purple false brome is considered unpalatable to livestock and wildlife, and threatens native plant communities through its potential to displace native plant species.

- *Bromus tectorum* (cheatgrass): Cheatgrass, widely known for its rapid invasion and degradation of the intermountain West's semiarid grasslands, shrublands, and woodlands (Young et al. 1972, Mack 1981, Billings 1990), is a winter annual grass that continues to remain rare in the California floristic province, but has thoroughly invaded roadsides along Morgan Valley Road west of the KWA. It is native to Eurasia, was first introduced into multiple sites both intentionally and as a contaminant of wheat seed, and spread throughout the western U.S. along railroads and other rights of way, via livestock, agriculture, and other natural and human vectors (Mack 1981, Mosely et al. 1999).

Cheatgrass threatens the KWA's grasslands and oak woodlands with its potential to displace native and other exotic species (Mack 1981, Billings 1990, Knick and Rotenberry 1997). Sites most susceptible to cheatgrass invasion are those with deep, loamy soils, and south-facing slopes. Cultivation and subsequent land abandonment, overgrazing, and repeated fire can all interact to proliferate cheatgrass, though it can also invade wildlands (Mosely et al. 1999).

Cheatgrass can spread short distances via wind, while animals (wild and domestic) carry cheatgrass in their feces, hooves, hair, feathers and tails, and humans carry it in their shoes and socks. Though most cheatgrass seeds generally do not survive longer than one year in grasslands, they may remain viable for several years when stored dry within bales of hay or straw (Mosely et al. 1999). Although cheatgrass may be at the edge of its range at the KWA, it has been shown to exhibit a tremendous range of environmental tolerance (Billings 1990, Young and Allen 1997), and therefore should be eradicated before random or other events enable roadside infestations to expand into adjacent plant communities.

- *Carduus pycnocephalus* (Italian thistle): Italian thistle is an annual thistle that is native to the Mediterranean. It was accidentally introduced to California in the 1930s, and is now widespread below 3000 ft elevation, except in deserts (Goeden 1974, Bossard and Lichti 2000). At the KWA it is widespread, but seems to thrive in oak savannahs, under the canopy of blue oaks, or in grasslands that have been disturbed (e.g., by past oak clearing). Italian thistle grows from ankle to waist height. The purple flower heads are smaller and fewer than those of bull thistle.

Italian thistle can reach high density within local patches and can outcompete and displace native species. Because it frequently grows beneath oaks it also has the potential to carry fire into the canopy.

- *Centaurea melitensis* (tocalote): Tocalote threatens plant communities at the KWA by its ability to displace native plants and animals, and reducing reproduction of some endangered plants. In general, little is known about the biology of tocalote (DiTomaso and Gerlach 2000). It is widely distributed in California, but is most widespread in the southern part of the state, with scattered small to medium-sized populations occurring in and north of the Bay Area. It is generally believed to be spreading northwards. In northern California, it appears to be most prevalent on warm, south-facing slopes, rocky habitats, and even serpentine habitats. On the KWA, it remains scarce. Tocalote is a winter annual whose early rosette growth form is similar to that of yellow starthistle. It was brought to California as a contaminant in wheat, barley, and oat seed during the Spanish mission period, with the earliest record of its appearance being seed in adobe bricks of a building constructed in 1797 in San Fernando. It appears to have been distributed in dry-farmed grain fields, and continues to be spread by humans, wild and domestic animals, and wind (DiTomaso and Gerlach 2000).

Tocalote produces several solitary or clustered spiny yellow-flowered heads during spring and early summer, with spines shorter and more lateral than those of *C. solstitialis*, and a brownish/purple tinge to the flowerhead. Flowerheads are produced from April through June (approximately 4-6 weeks before yellow starthistle begins flowering). Tocalote germinates in the fall, bolts in early spring, and flowers in April-June. Flowering plants produce 1-100 heads with 1-60 seeds per head. Plants range in height from 5-90 cm (DiTomaso and Gerlach 2000).

- *Centaurea solstitialis* (yellow starthistle): An important candidate for weed management is yellow starthistle. In areas that it has yet to invade, such as most serpentine and roadless grasslands, the goal should be to prevent its introduction and/or spread. In areas where it is already abundant, such as in sites near most roads (especially on non-serpentine habitats), control and management can be effective.

This species was probably first introduced into California in the mid-1800's, and has been spread along roads and other rights of way and throughout grasslands by vehicles, livestock, streams, wildlife, and wind (Roché and Roché 1988, Gerlach et al. 1998, Sheley and Petroff 1999). It germinates in the fall, grows a deep taproot while maintaining a small basal rosette, bolts in late May through the senescing canopy of annual grasses, and flowers during summer (Roché et al. 1994, Sheley and Petroff 1999). It is shade intolerant and prefers deep, fertile soils (Roché et al. 1994).

Centaurea is abundant near roads (Roché and Roché 1988, Benefield et al. 1999, Gelbard and Harrison 2003), but has spread rapidly into adjacent grasslands, especially where vegetation and soils are disturbed (Roché and Roché 1988, Gerlach et al. 1998, Sheley and Petroff 1999). Its spread has

intensified since the 1960's with the proliferation of road building, urbanization, and ranching (Gerlach et al. 1998).

- *Cirsium vulgare* (bull thistle): Bull thistle is a robust biennial thistle with dark green foliage and purple flowerheads that are one to two inches wide. It is native to Europe, west Asia and north Africa, and it is now naturalized throughout the United States (Randall 2000). It was probably introduced as a seed contaminant in early colonial times and reached California by the late 1800s. At the KWA, bull thistle is patchy, and usually associated with wet areas. Most populations occur around stock ponds or non-serpentine seeps. At the KWA bullthistle can outcomplete native seep vegetation, but it is unlikely to have widespread impacts in drier habitats.
- *Cortaderia sellanoa* (pampas grass): Pampas grass is a common ornamental plant native to Argentina, Brazil, and Uruguay that has escaped cultivation and spread along sandy, moist ditch banks throughout coastal regions of Southern California; its distribution appears to be expanding (DiTomaso 2000a). It does not occur at the KWA, but is abundant in Cache Creek, to the east of Blue Ridge. It threatens riparian areas at the KWA via its potential to compete with seedling trees, shrubs, and herbaceous plants and slow their establishment and growth ((DiTomaso 2000a). It also creates a fire hazard and competes with native vegetation, reducing the aesthetic and recreational value of riparian areas .

Pampas grass is a perennial grass that grows 2-6 meters tall, with long leaves rising from a tufted base. Stemmed plumes consist of hairy female flowers, deep violet when immature, turning pink to white when mature. It flowers 2-3 years after germination, usually from late August through September, but sometimes in winter. Vegetative reproduction can occur when fragmented tillers receive adequate moisture and develop adventitious roots at the base of the shoot. Seedling establishment generally occurs in spring, requiring sandy soils, adequate moisture, and light; seedling survival is low in shaded areas or in competition with grasses or sedges. It is drought and heat tolerant, and once established, its roots can occupy a soil volume of up to 103 m², with roots spreading up to 4 m in diameter and 3.5 m in depth. Plants survive roughly 15 years (DiTomaso 2000a).

- *Dipsacus sylvestris* (teasel): Teasel is large biennial that flowers on meter-high stalks that originate from basal rosettes. The rosettes and flowering stalks form dense stands, which include dried accumulated stalks from the past years' flowering. Teasel is a native of Europe, and is now a ubiquitous weed in the United States. In the vicinity of the KWA teasel occurs in pastures, wet areas and seeps. Teasel has not yet been recorded in the KWA, but occurs several miles to the west in Morgan Valley. Teasel poses a particular threat to serpentine seeps because it appears capable of invading despite harsh soil conditions. Once established, it forms large monospecific stands that replace native seep vegetation.

- *Lepidium latifolium* (perennial pepperweed): Perennial pepperweed is a member of the mustard family native to Eurasia that threatens riparian areas by forming monospecific stands that exclude other plants (Corliss 1993, Trumbo 1994). In waterfowl nesting areas, it outcompetes grasses that provide food for waterfowl, and in hay meadows, it reduces forage value. It occupies an expanding area of grassland, riparian, and roadside habitats along Knoxville Creek, centered around the historic Knoxville town site. Its distribution is concentrated near streams and in gullies, but has expanded across the old fields around Knoxville, as well as roadsides. Perennial pepperweed appears to be spreading rapidly down Knoxville Creek, though it is also moving slowly uphill, likely via vectors such as vehicles, wind, researchers, wildlife, and perhaps weed technicians treating tamarisk infestations.

This noxious weed is a multi-stemmed herb that grows 1-2.5 m tall and contains a heavy, sometimes woody crown and spreading underground root system (Howald 2000). Stems and leaves are gray-green, and tiny white flowers, produced in May-July, occur in dense clusters at the tops of stems. Perennial pepperweed was first documented in California in 1936, and may have been introduced to California as a contaminant of sugar beet seed (Robbins et al. 1951). It may have also been introduced as a contaminant of straw bales used to stabilize soils in roadside construction areas (Howald 2000). Perennial pepperweed prefers brackish to saline or alkaline wetlands, in full sun on heavy, moist soils, but is also found in native hay meadows and as a weed in agricultural fields where soil is slightly alkaline or saline, as well as drier sites (Howald 2000).

- *Phalaris aquatica* (Harding grass): Harding grass is a stout perennial grass with grayish to bluish green leaves that reaches 1 to 1.5 meters in height. Its occurrence is patchy across the KWA, but it can be locally abundant. It reaches its highest density on the grassy slopes between the mouths of Long Canyon and Foley Canyon (Appendix B). During the ranching period at the KWA, Harding grass was probably intentionally planted as forage for cattle. Harding grass occurs throughout non-serpentine grasslands and oak savannahs at the KWA. It is also sometimes concentrated around ponds and streams because it tolerates wet conditions.

Harding grass can outcompete and displace native plant species (Harrington and Lanini 2000), but at the KWA it appears to spread more slowly and maintain lower densities than many of the annual non-native grasses. For this reason, Harding grass is classified as a relatively low priority for management.

- *Taeniatherum caput-medusae* (medusahead): Medusahead is an annual grass that is widespread throughout oak savannahs and serpentine and non-serpentine grasslands at the KWA. Of all species on the hot list, it is probably the best established at the KWA. Medusahead is distinctive in grasslands because it reaches high densities and forms a uniform cover. Because of its high silica

content medusahead is unpalatable to livestock or native herbivores, except in its earliest stages of growth. Unlike many other non-native annual grasses that decompose after seed set, medusahead persists through the winter and forms a dense thatch, which inhibits germination of native species and increases the likelihood and intensity of wildfire (Kan and Pollak 2000).

Medusahead is native to the Mediterranean region. It was introduced to the United States in the late 1800s, but has spread widely throughout California only in the last 50 years. Medusahead can negatively affect the ecosystem by outcompeting and replacing native species, by tying up nutrients, and by increasing the intensity and frequency of fire. It also has a greater ability than many other non-native annual grasses to invade some serpentine grasslands.

- *Tamarix ramoissima* (tamarisk, salt cedar): Tamarisk is a many-branched shrub or tree less than 8 meters tall with small, with scale-like leaves that contain salt glands, and small white to deep-pink flowers which occupies habitats around streams and gullies on the KWA, mainly along Knoxville and Eticuera Creeks. The Department initiated an eradication program for tamarisk at the KWA in 2001, which is ongoing, but localized resprouting continues.

Tamarisk threatens the KWA's riparian communities by causing dramatic changes in geomorphology, groundwater availability, soil chemistry, fire frequency, plant community composition, and native wildlife diversity (Lovich 2000). It traps and stabilizes alluvial sediments, resulting in narrowing of stream channels and more frequent flooding, and has been blamed for lowering water tables because of its high rates of evapotranspiration. Soil salinity increases due to inputs from salt glands on leaves, inhibiting growth of native riparian species (Anderson 1996), while leaf litter from the deciduous species increases fire frequency and alters soil chemistry to favor itself over potentially competing riparian species (Busch 1995).

Tamarisk is native to Central Asia, from the Near East around the Caspian Sea, through western China and North Korea (Baum 1978). It may have been introduced into California by the Spanish, but was not recognized until the 1800's (Robinson 1965). It was intentionally introduced throughout the West to provide windbreaks, erosion control, and shade, and as an ornamental. It has spread via seed and vegetative growth, with individual plants producing 500,000 tiny seeds per year (DiTomaso 1996), which are readily wind and water-dispersed. It also resprouts via roots (Lovich et al. 1994).

Table 2. "Hot list" of invasive species that have invaded or have the immediate potential to invade the Knoxville Wildlife Area, and which are of a high priority for management due to potential severity of impacts and feasibility of control.

Scientific Name	Common Name	Potential Threat			Action
		Serpentine	Riparian	Grassland	
<i>Aegilops triuncialis</i> *	barbed goatgrass	high	moderate	moderate	monitor, prevent
<i>Arundo donax</i> *	arundo, giant reed	low	high	low	monitor, prevent
<i>Brachypodium distachyon</i> *	purple false brome	low	low	high	monitor, prevent
<i>Bromus tectorum</i> *	cheat grass	low	low	high	monitor, prevent
<i>Carduus pycnocephalus</i>	Italian thistle	low	low	high	monitor, control and manage
<i>Centaurea melitensis</i>	totalote	moderate	low	high	monitor, control and manage
<i>Centaurea solstitialis</i>	yellow starthistle	low	high	high	monitor, control and manage
<i>Cirsium vulgare</i>	bull thistle	low	moderate	moderate	monitor, eradicate
<i>Cortaderia sellanoa</i> *	pampas grass	low	high	low	monitor, prevent
<i>Dipsacus sylvestris</i> *	teasel	moderate	high	moderate	monitor, prevent
<i>Lepidium latifolium</i>	perennial pepperweed	low	high	moderate	monitor, eradicate
<i>Phalaris aquatica</i>	Harding grass	low	moderate	high	monitor, control and manage
<i>Taeniatherum caput-medusae</i>	medusahead	moderate	low	high	monitor, control and manage
<i>Tamarix ramoissima</i>	tamarisk, salt cedar	low	high	low	monitor, eradicate

*Not yet recorded at the KWA.

❖ Animal Species

The list of vertebrate species known or thought to occur on the Knoxville Wildlife Area includes 175 birds (Appendix F), 54 mammals (Appendix G), 1 fish (the California roach), 18 reptiles, and 6 amphibians (Appendix H). This list is derived primarily from the monitoring data collected at Homestake Mining Company's former McLaughlin Mine (currently the UC McLaughlin Reserve), which is located adjacent to the KWA and has many of the same vegetation types. For terrestrial vertebrates, monitoring data consist of initial field surveys conducted by D'Appolonia Consulting Engineers in 1981 and 1982 and records of wildlife sightings that were kept by Homestake Mining Company from 1984 until 2002. The majority of bird and mammal records were from UC Davis scientist Dr. Darrell Slotten during his work on mercury at the Davis Creek Reservoir. Additional bird data were obtained from the Breeding Bird Atlas of Napa County (Berner et al. 2003). Fish data consist of annual counts that were conducted by Bodega Research Associates along Knoxville Creek between 1984 and 2002 (Enderlin 2002). The primary fish sampling station is upstream of the KWA, just upstream of the historic

Knoxville town site. In 1994 two additional sampling stations were established on what is now the KWA, at a location along Knoxville Creek about 1.6 miles downstream of the primary station. These additional stations were added because they had consistently larger fish populations than the upstream site.

In addition to these historic data from the McLaughlin Mine and other sources, two types of targeted surveys for sensitive species were conducted as part of the preparation of this plan. The first survey focused on confirming the occurrence of prairie falcon aeries in the bluffs on the west side of Blue Ridge. The prairie falcon is listed as a species of special concern by the Department and prairie falcons could potentially be affected by any trail construction on or near Blue Ridge. During spring of 2003, three trips were made to two locations on Blue Ridge to locate prairie falcons.

The second class of targeted surveys focused on aquatic reptiles and amphibians and their habitat. Two aquatic species of special concern, the foothill yellow-legged frog and the western pond turtle, are known to occur at the KWA, and a third, the California red-legged frog (listed as federally threatened), could potentially occur. Habitat quality for foothill yellow-legged frogs and western pond turtles is potentially high at KWA, and aquatic habitats are likely to be affected by current and future management practices. For example, tamarisk removal along Knoxville Creek has already changed the structure of riparian vegetation, and may have affected flow characteristics of the creek. In addition, the KWA contains more than 20 man-made stock ponds. Many of these ponds may provide habitat for herptiles of special concern, as well as for introduced bullfrogs, and provide water for other wildlife species. Some of these ponds require immediate repair if restoration of their water-holding capacity is desired, and many will require long-term maintenance. Surveys for aquatic reptiles and amphibians and their habitats included three wet-season road surveys along Berryessa-Knoxville Road (which runs along Knoxville and Eticuera Creeks), two nighttime spotlight surveys of ponds and creeks, and photodocumentation of all known stock ponds on the KWA (Appendix B).

❖ **Animal Species of Special Concern**

Six species listed by the Department as Species of Special Concern are confirmed to occur and/or breed on the KWA. These are the foothill yellow-legged frog (*Rana boylei*), western pond turtle (*Emys marmorata marmorata*), Cooper's hawk (*Accipiter cooperii*), the prairie falcon (*Falco mexicanus*), long-eared owl (*Asio otus*), and California sage sparrow (*Amphispiza belli belli*). In addition, the golden eagle and sharp-shinned hawk are listed in *Breeding Birds of Napa County, California* as "possible" breeders on or in the vicinity of the KWA. Other special status species that occur in the vicinity of the KWA include the osprey (a species of special concern), which breeds on nearby Davis Creek Reservoir and Lake Berryessa, and the bald eagle (federally threatened, California endangered), which breeds on Davis Creek Reservoir. The Townsend's big-eared bat (a species of special concern) has breeding colonies in abandoned mine shafts at the McLaughlin Reserve.

Foothill yellow-legged frog—Foothill yellow-legged frogs appear to be common in Knoxville Creek and Eticuera Creek. Two CNDDDB records exist for foothill yellow-legged frogs in Eticuera Creek. In addition, a nighttime survey for yellow-legged frogs along a segment of Knoxville Creek on March 14, 2004 yielded eight adults (all or mostly males) in a segment of creek approximately 0.17 miles long. This stretch of creek is in the northeast corner of Section 17, immediately downstream of the private parcel containing the burnt out remains of a cabin and in a section of creek that has been treated for tamarisk removal. A second survey was conducted along a short stretch of Eticuera Creek at the south end of the KWA on the same night. No yellow-legged frogs were detected on this survey.

Foothill yellow-legged frogs occur in streams within woodlands, chaparral, or forest. They prefer open, sunny stretches of stream with rocks and shallow riffles, and breed between mid-March and early June after high waters have subsided. At the KWA, foothill yellow-legged frogs appear to be the primary aquatic herptiles occupying such habitat. Other aquatic herptiles, including the Pacific treefrog (*Pseudacris (Hyla) regilla*) frogs, western pond turtles, bullfrogs, and California newts were most abundant in ponds or in sections of stream with relatively slow moving or deep water.

Western pond turtle—Western pond turtles also appear to be common in Knoxville and Eticuera Creeks. The CNDDDB includes one non-specific location for western pond turtles in Eticuera Creek. In addition, pond turtles were observed incidentally by Department and UC Davis personnel in an oxbow of Knoxville Creek that has been cut off by Berryessa-Knoxville Road and now forms a small pond. The nighttime survey of March 14, 2004, yielded one pond turtle in the stretch of Eticuera Creek at the very south end of the KWA, but no pond turtles in the more shallow stretch in the northeast corner of Section 17.

Western pond turtles occur in woodlands, grasslands, or open forests in ponds, marshes, rivers, streams and irrigation ditches with rocky or muddy bottoms and emergent vegetation such as cattails or bullrush. They breed between April and August.

Cooper's hawk—In 1991 an active Cooper's hawk nest was found at the same site in the KWA where a long-eared owl was confirmed nesting in the previous year (Berner et al. 2003).

Prairie falcon—Several CNDDDB records exist for prairie falcon aeries along the sandstone bluffs on the west face of Blue Ridge. On April 22, 2003, an active aerie was located by UC Davis personnel (Paul Aigner) on a large bluff at the south end of the KWA. This nest site is on BLM land adjacent to the KWA but is included here because human activity within the KWA below the nest site clearly elicited alarm behavior from both adult birds. Prairie falcons inhabit dry open country. They were not observed foraging within the KWA, indicating that their home range probably extends far beyond the boundaries of the Wildlife Area.

Long-eared owl—In June 1990 a long eared owl was discovered by George Gamble on the KWA, and nesting was subsequently confirmed by Bill Grummer (Berner et al. 2003). Long-eared owls typically occupy bottomlands with tall willows and cottonwoods, but also belts of live oaks, particularly paralleling stream courses. It also requires nearby open terrain for hunting.

California sage sparrow—During biological inventories conducted by UC Davis personnel in 2003 California sage sparrows were detected in chamise chaparral in the upper reaches of Foley Canyon, in an area that had burned in 1999. California sage sparrows occupy shrublands in which shrubs do not form a closed canopy, but instead are separated by areas of bare ground or native forb cover. In the vicinity of the KWA, they appeared most abundant in chamise chaparral that had burned in 1999. They also occur in chaparral growing on serpentine substrates, which tends to be more open than non-serpentine chaparral. Periodic fires maintain an open canopy in chaparral and may be beneficial for sage sparrows. However, if fires occur at too high a frequency or facilitate the invasion of non-native grasses into chaparral, then sage sparrows may decline (Knick and Rotenberry 2000).

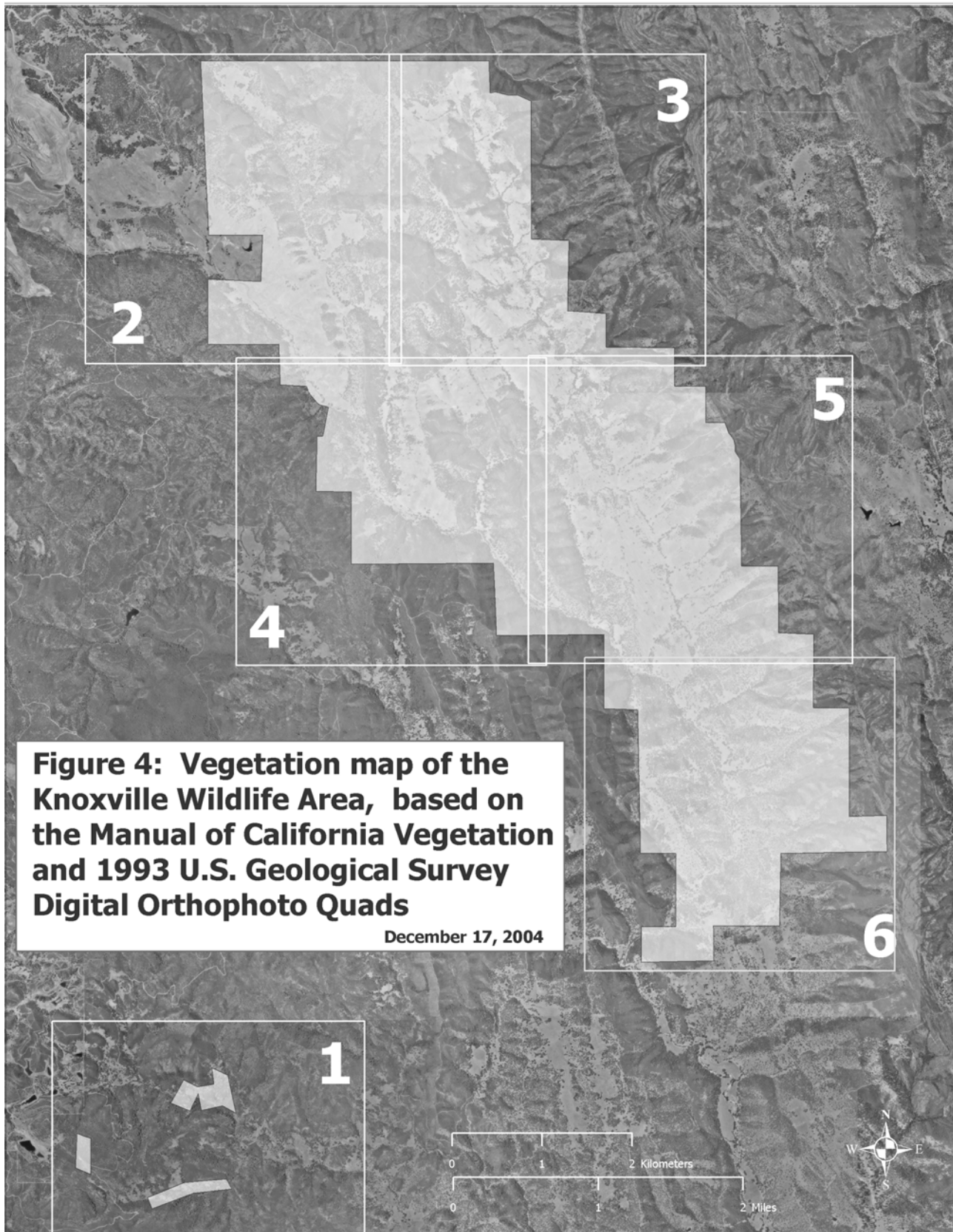
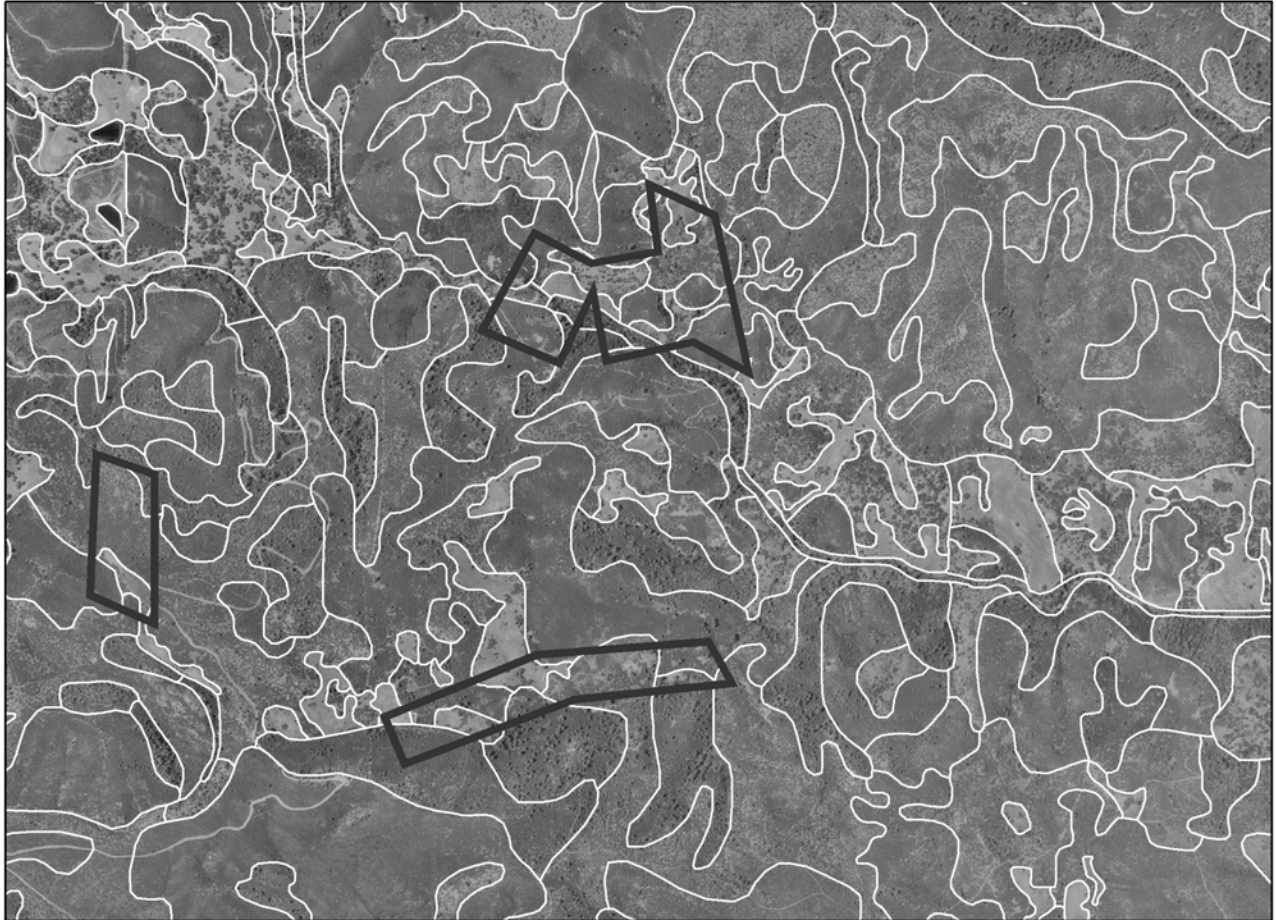


Figure 4.1: Vegetation map of the Knoxville Wildlife Area based on the Manual of California Vegetation and 1993 U.S. Geological Survey Digital Orthophoto Quads



Block 1

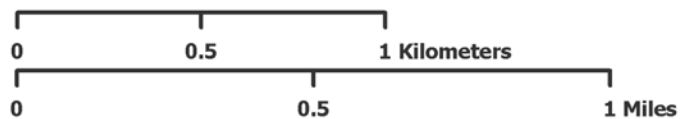


Figure 4.2: Vegetation map of the Knoxville Wildlife Area based on the Manual of California Vegetation and 1993 U.S. Geological Survey Digital Orthophoto Quads

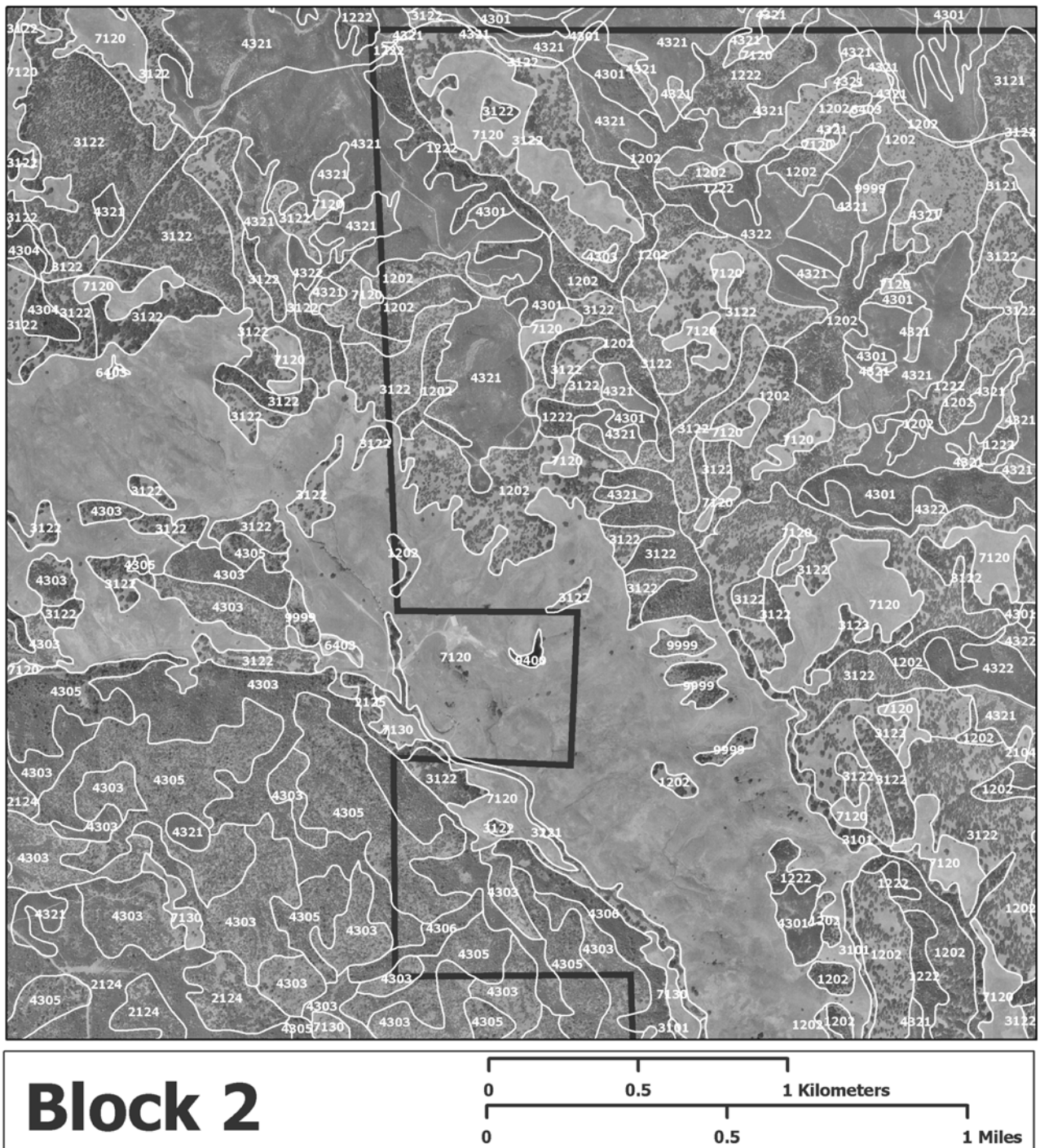


Figure 4.3: Vegetation map of the Knoxville Wildlife Area based on the Manual of California Vegetation and 1993 U.S. Geological Survey Digital Orthophoto Quads

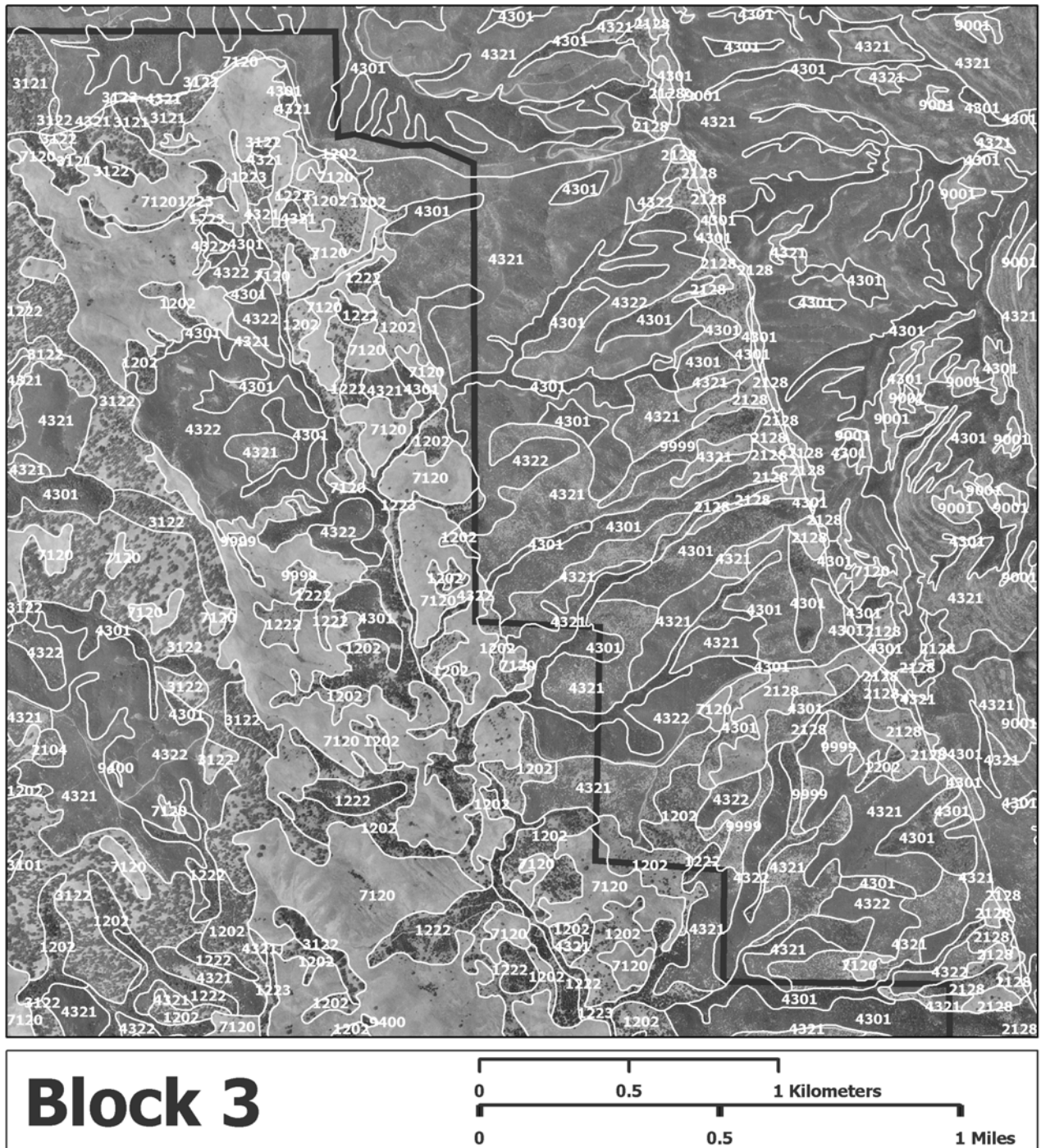
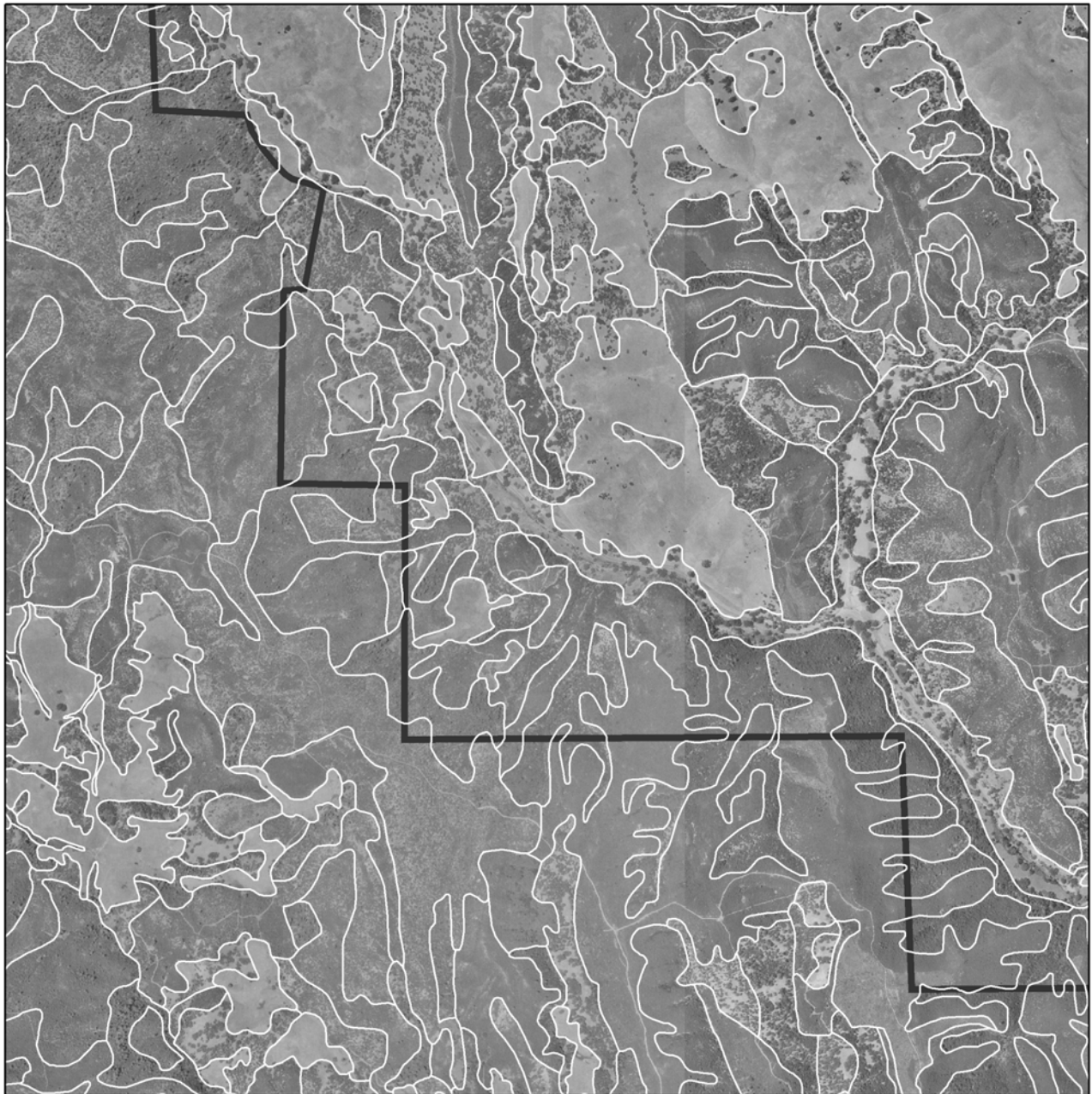
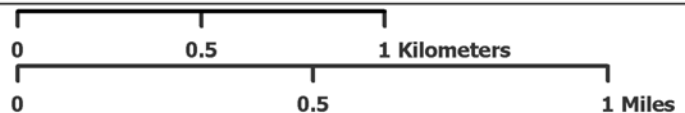


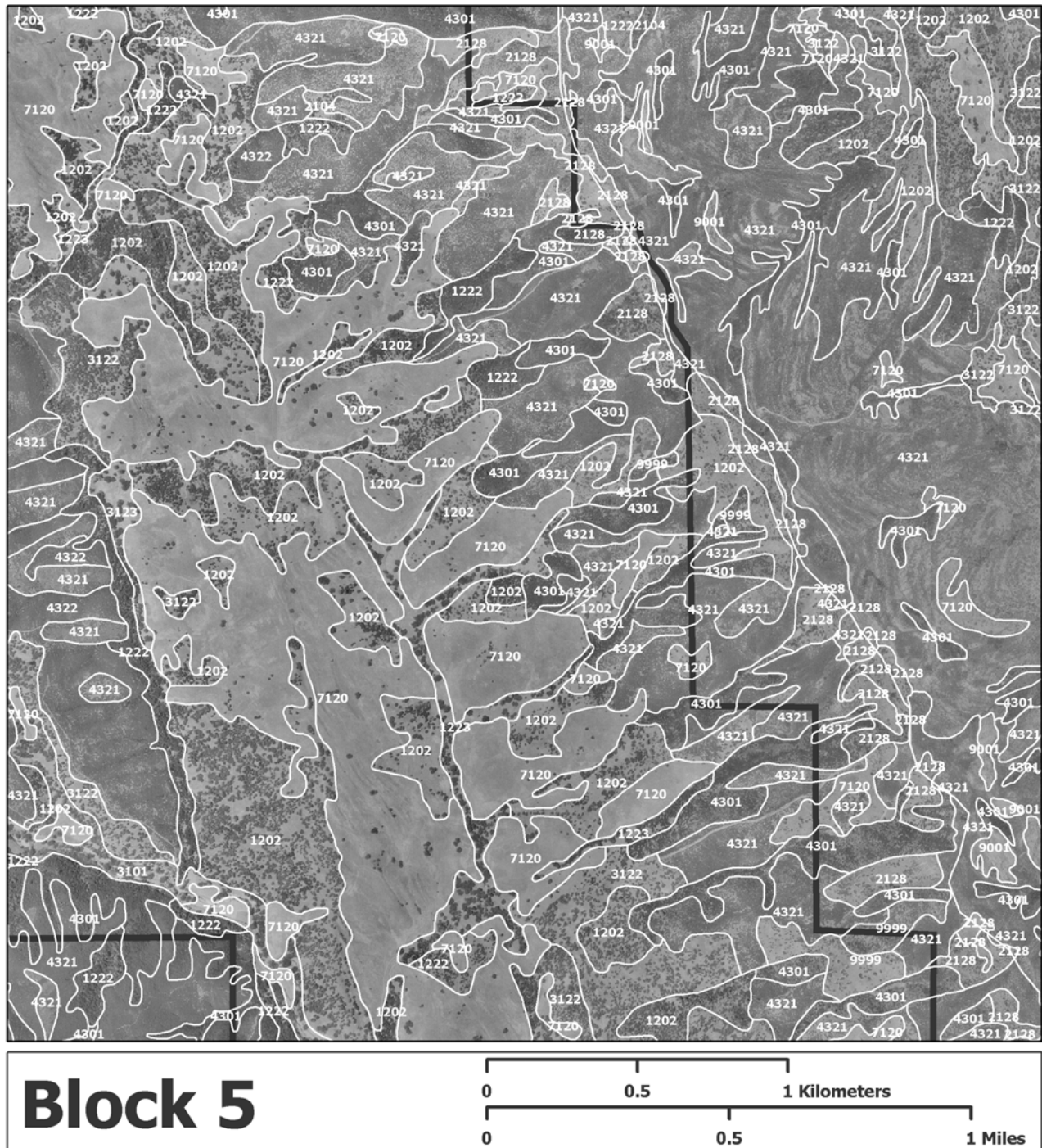
Figure 4.4: Vegetation map of the Knoxville Wildlife Area based on the Manual of California Vegetation and 1993 U.S. Geological Survey Digital Orthophoto Quads



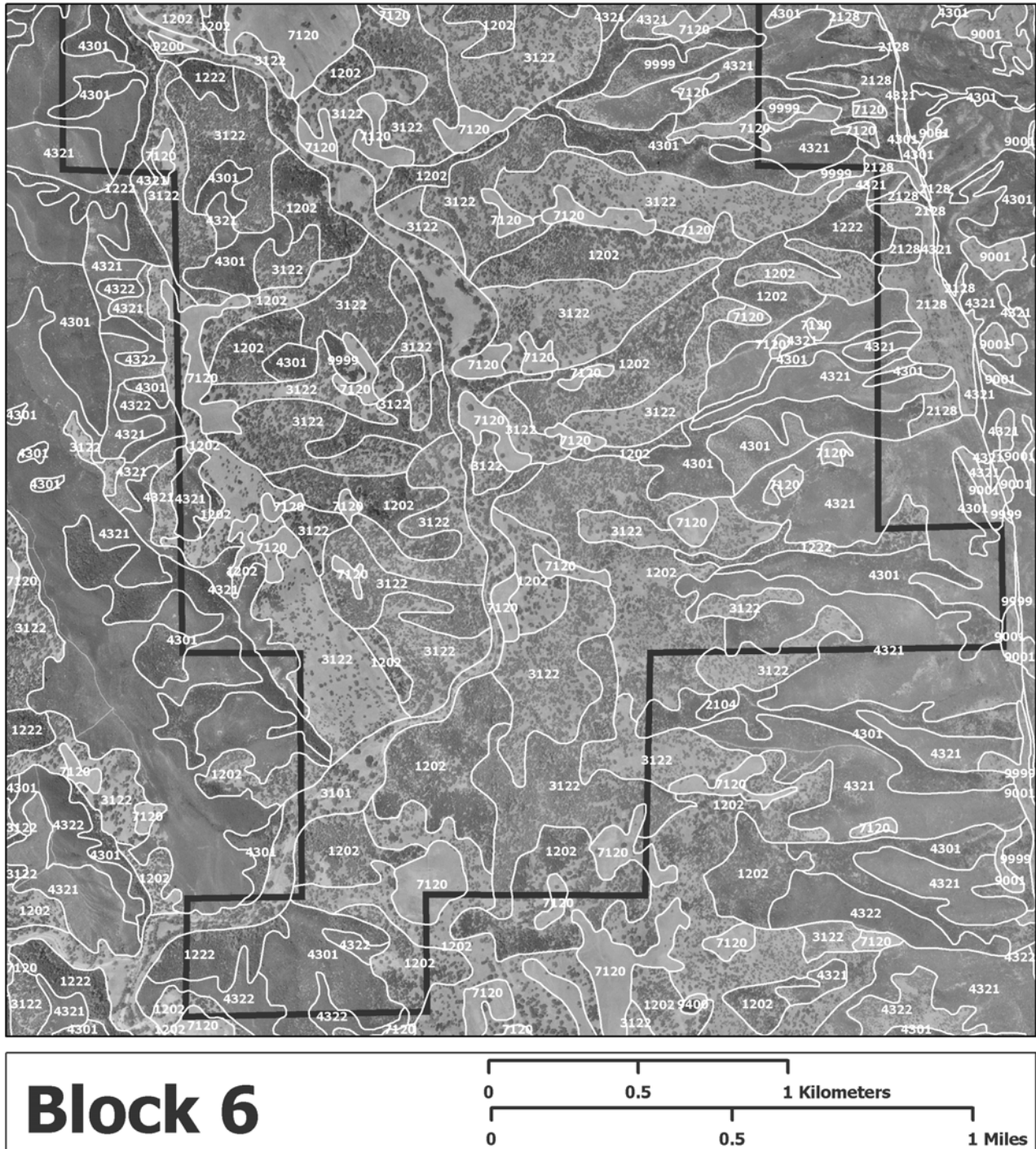
Block 4



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IV. WILDERNESS ASSESSMENT

❖ California Wilderness

California is one of seven states that have a state wilderness acts complementing the Federal Wilderness Act of 1964. The California Wilderness Act (CWA) mirrors the federal act in most respects and is contained in the California Public Resources Code (PRC) at Section 5093.30-5093.40. PRC Section 5093.33(c) defines state wilderness as:

an area of relatively undeveloped state-owned land which has retained its primeval character and influence or has been substantially restored to a near natural appearance, without permanent improvements of human habitation, other than semi-improved campgrounds and primitive latrines, and which is protected and managed so as to preserve its natural conditions and which:

1. Appears generally to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable.
2. Has outstanding opportunities for solitude or a primitive and unconfined type of recreation.
3. Has at least 5,000 acres of land, either by itself or in combination with contiguous areas possessing wilderness characteristics, or is of sufficient size as to make practicable its preservation and use in an unimpaired condition.
4. May also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

Once an area has been designated wilderness, the state agency with jurisdiction over the area must manage the new area to preserve its wilderness character. The following activities are explicitly prohibited in a state wilderness area.

- Commercial enterprises
- The construction of permanent roads
- The use of motorized vehicles or equipment except in emergencies involving the health and safety of persons within the wilderness area.
- The use of mechanical transport such as bicycles.
- The construction of new structures or installations.
- Livestock grazing, unless established prior to January 1, 1975.
- Flying of aircraft lower than 2,000 feet above the ground (except for aerial stocking of fish or aerial wildlife surveys).

The California Wilderness Act also specifically allows a number of activities, unless prohibited by another statute or agency policy. Permitted activities include:

- Hunting and fishing.
- Construction of primitive campgrounds or latrines.
- Control of fire, insects, and disease, including the use of mechanized equipment for these purposes if deemed desirable by the managing agency.
- The collection of hydrometeorological data and the conduct of weather modification activities.
- Access to private land that is completely surrounded by wilderness, even if such access requires construction of a new road across state wilderness.

❖ **Suitability of KWA for Preservation as Wilderness**

The California Wilderness Act requires that the Secretary of the Resources Agency review and report on the suitability of all state-acquired roadless areas for preservation as wilderness within three years of their acquisition. Thus, as part of this management plan the Department has a responsibility to evaluate the suitability of the KWA for wilderness designation. This evaluation consists of two components: (1) an assessment of whether all or part of the KWA is eligible for wilderness designation (i.e., does it meet the minimum standard for wilderness?), and (2) a review of how wilderness designation would affect the ability of the Department to manage the area for the protection and enhancement of wildlife habitat and for the provision of wildlife-related public use opportunities.

Eligibility of the KWA for wilderness – The KWA is bisected along its north-south axis by the Berryessa-Knoxville Road, a single-lane paved road that is maintained by Napa County. As a whole then, the KWA cannot be considered "roadless." Of the total 8080 acres comprising the KWA, about 6,563 lie on the east side of the road and the remaining 1,517 are on the west. The 1,517 acres on the west side of Berryessa-Knoxville Road abut the BLM Knoxville Recreation Area and private land. The Knoxville Recreation Area is managed for off-highway vehicle use, and therefore does not possess wilderness characteristics. Thus, the 1,517 acres on the west side of Berryessa-Knoxville Road fail to meet wilderness eligibility because the area is substantially less than 5,000 acres by itself and because there is no contiguous area of public land possessing wilderness characteristics. The remaining 6,563 acres east of Berryessa-Knoxville Road is a roadless area of sufficient size to be evaluated for wilderness eligibility.

The first element of the California wilderness definition specifies that wilderness must have "a near natural appearance," be "without permanent improvements or human habitation," and "[appear] generally to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable."

The primary land uses at the KWA since Europeans settled the area in the mid 1800s have been mining and grazing. The northwest end of the KWA abuts the Reddington mercury mine and includes part of the historic town site of Knoxville. At its heyday in the late 1800s Knoxville was a town of several hundred people, however there is currently little evidence of this habitation. All structures have deteriorated and been removed, and the only evident impact is that the area surrounding the town site is dominated by invasive weeds and is devoid of woody vegetation. Close inspection reveals some scattered building foundations and road cuts. Most impacts to the KWA resulting from activity at the Reddington Mine would be "substantially unnoticeable" to a visitor unfamiliar with the history of the area.

The impacts of ranching at the KWA are more diffuse and more widespread than those of mining. Remaining evidence of past ranching includes barbed-wire fences, ranch roads and firebreaks, a water storage and delivery system including earthen dams (as many as 22), troughs (about 30), tanks (2), and about 10 miles of pipe, three old corrals, the remains of a windmill, stumps from oak removal, and some extensive areas of nonnative plants, including some pasture grasses that were probably planted intentionally. The remains of a hunting cabin were recently removed by the Department. Whether these imprints are substantially unnoticeable is debatable. Most ranch roads and firebreaks are overgrown and resemble foot paths and many of the earthen dams are breached and partly eroded. Stock ponds that are intact have a semi-natural appearance and enhance habitat for several native wildlife species. The two most substantial corrals are along Berryessa-Knoxville Road and could easily be excluded from a potential wilderness area. Many remaining impacts (pipes, troughs, fences, and tanks) could be removed if wilderness designation was desired. In sum, noticeable impacts of ranching probably affect less than 1% of the total area of potential wilderness, and the argument that these are therefore "substantially unnoticeable" seems reasonable and also likely to be supported by state and federal precedent.

The second element of the California wilderness definition is that the area has "outstanding opportunities for solitude or a primitive and unconfined type of recreation." On this point, it seems clear that the KWA meets the definition. The KWA itself has outstanding opportunities for solitude—except during peak visitation periods in the hunting season, a visitor who spends a day hiking in the KWA is unlikely to encounter another human being or to hear a motorized vehicle (save an occasional airplane). The potential for solitude is enhanced by the fact that the KWA is centered within a much larger landscape (the 600,000-acre BRBNA) that has little development. The KWA is part of a mosaic of undeveloped public lands that stretch from just outside of Clearlake almost to Lake Berryessa with only three lightly-used roads intervening. A dedicated enthusiast of "primitive and unconfined recreation" could hike for nearly 40 miles without encountering substantial development.

The third element of the California wilderness definition is that the area "has at least 5,000 acres of land, either by itself or in combination with contiguous areas possessing wilderness characteristics, or is of sufficient size as to make practicable its preservation and use in an unimpaired condition." As already discussed, the portion of the KWA to

the east of Berryessa-Knoxville Road exceeds 5,000 acres. In addition it is contiguous to the 10,880-acre Blue Ridge Proposed Wilderness, managed by the BLM.

The fourth and last element of the definition is that "it may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value." The KWA has significant features with all of these values. Its position straddling the Stony Creek Fault, which separates the sedimentary deposits of the Great Valley Sequence from the serpentine and related rocks of the Coast Range Ophiolite makes it of interest to geologists and ecologists alike. This unique geology is also responsible for the mercury deposits that attracted miners to the region 150 years ago. The history of mining has endowed the KWA with exceptional historical and archaeological value.

The KWA provides outstanding examples of oak woodlands and grasslands dominated by native perennial bunchgrasses, both of which are under represented in the public lands of California. It provides habitat for numerous wildlife species that are of special concern to the Department or are of interest to the public, including tule elk, prairie falcon, bobcat, black bear, mountain lion, sage sparrow, pileated woodpecker, golden eagle, and foothill yellow-legged frog.

Compatibility of wilderness designation with the management goals of the KWA—

While the Knoxville Wildlife Area may be eligible for wilderness designation, such designation would not facilitate management activities to protect and enhance wildlife habitat. With respect to management of public use at the KWA, wilderness designation would have minimal effect on the Department's management strategy, because most public activities that are compatible with the purpose of the wildlife area are not restricted by the California Wilderness Act. The exception to this would be the restriction of human-powered mechanized equipment, such as bicycles or carts. In contrast, wilderness designation would have great potential impact on the ability of the Department to manage vegetation or wildlife habitat, primarily because wilderness status would preclude the use of techniques that rely on motorized equipment and would prohibit grazing as a management tool.

The California Wilderness Act requires that state wilderness areas be managed to preserve their "recreational, scenic, scientific, educational, conservation, and historical" uses. In existing state wilderness areas, which are predominantly managed by the Department of Parks and Recreation, this mandate has been interpreted to allow management activities such as the construction of recreational facilities (e.g., trails and horse corrals), prescribed burning, control of invasive species, restoration of native plant communities, and the installation of low-impact water sources for wildlife. Under the CWA, these activities must be undertaken without the use of mechanized equipment.

Designation of the KWA as a wilderness area would impose costs on the Department by requiring that existing and planned management activities be undertaken with more labor-intensive non-mechanized techniques. Currently the Department uses motorized equipment such as chainsaws and tractors to control invasive species and to maintain the existing system of old ranch roads. In addition the Department uses all-terrain

vehicles and full-sized motor vehicles for a variety of administrative purposes, such as the biological and archaeological surveys that were conducted for this management plan. The Department anticipates that motorized vehicles and equipment will have a substantial role in management activities for the foreseeable future, including:

- use of tractors for mowing trails or weeds such as starthistle, perennial pepperweed, or Harding grass.
- use of motorized sprayers for the application of herbicide to control invasive species.
- use of chainsaws for the control of tamarisk and for the removal of downed trees from existing trails.
- use of bulldozers or water pumpers to maintain a portion of the old ranch roads and possibly to help create fire breaks for prescribed burns.
- use of heavy equipment to repair or remove earthen dams at existing stock pond sites.
- use of motorized vehicles to carry personnel, supplies, and equipment for habitat restoration (e.g., oak replanting).
- use of motorized vehicles for administrative purposes such as biological or cultural resource inventories, research, and routine maintenance.

While all of these activities could be undertaken without motorized equipment, the cost to the Department to do so would be prohibitive, and the likely outcome would be that many management actions important to the protection and enhancement of native wildlife habitat and biodiversity would not be undertaken. For this reason the Department concludes that wilderness designation would inhibit the Department from undertaking the resource management goals for the Wildlife Area. As an alternative to recommending wilderness status, the Department proposes to manage the KWA in a manner that maintains its wilderness values to the extent feasible. For example, the Department may:

- limit public recreation to non-motorized and non-mechanized activities (except for access by bicycles).
- use motorized vehicles for management activities as judiciously as possible
- remove signs of past human activity such as fences, hunting cabins, stock tanks etc., provided that such features have no management value or archaeological significance, and provided that such removal is feasible within budgetary constraints.

This management strategy should preserve the eligibility of the KWA to receive wilderness designation should such designation be determined desirable in the future.

V. COMPATIBLE PUBLIC USE

The Knoxville Wildlife Area was acquired by the Department to protect and enhance habitat for wildlife species, and to provide the public with wildlife-related recreational uses. The Knoxville Wildlife Area offers the public remoteness and natural beauty, potential encounters with diverse wildlife species, plant communities, and terrain, and good access via an extensive system of old ranch roads and trails. While such attributes are likely to attract a variety of recreational and other public uses, not all of these will be compatible with the wildlife area purpose. A critical component of this plan is to evaluate what potential public uses are compatible with the protection and enhancement of wildlife habitat, and within the existing framework of Department of Fish and Game Wildlife Area regulations.

Deer and upland game bird hunting has been the primary public use at the Knoxville Wildlife Area since the Department acquired the property in 2000. In addition, the KWA is used regularly by hikers and natural history enthusiasts, and has been a destination for outings organized by such groups as the Sierra Club, Land Trust of Napa County, and the California Native Plant Society. These uses have been largely dependent on and compatible with the protection of wildlife habitat. In addition to considering such existing uses in this management plan, the Department has a responsibility to anticipate future demand for uses that do not at this time regularly occur (e.g., bicycling, horseback riding) or are currently prohibited (e.g., vehicular travel off of county roads), and to evaluate their compatibility with the wildlife area purpose.

❖ Wildlife Area Regulations

Public use of all Wildlife Areas is regulated by the Department pursuant to the California Code of Regulations, Title 14 (Natural Resources), Division 1, Sections 550 and 551. Division 1 of Title 14 contains regulations that have been formally adopted by the California Fish and Game Commission, reviewed and approved by the Office of Administrative Law, and filed with the Secretary of State. Section 550 contains Regulations for General Public Use Activities, which are applicable to all Wildlife Areas. Section 551 contains Hunting, Firearms, and Archery Equipment and Permit Requirements, which include hunting regulations applicable to all Wildlife Areas as well as general public use regulations that apply to specific Wildlife Areas. In addition, standard hunting and fishing regulations apply to all Wildlife Areas.

Although regulations can be tailored to specific Wildlife Areas (see Section 551, subsection q), Sections 550 and 551 should be viewed as a framework within which public use can be addressed in this plan. By identifying activities that are incompatible with the wildlife area purpose, existing regulations may in some cases impose constraints on the management of public use at the KWA. For this reason, current regulations that apply to the KWA are provided as a reference for the reader. This

summary does not elaborate all requirements in detail and regulations are expected to change over time, so current regulations should be consulted for any determination about lawful use of a Wildlife Area. These regulations are available at the Fish and Game web site, and are published annually in a booklet.

In Section 550, all Wildlife Areas are classified as Type A, B, or C. Type A and B areas require specific permits or season passes, whereas Type C areas usually do not. Knoxville Wildlife Area is currently designated as a Type C area with no required permits or passes, no specified daily hunter capacity, no hunting check stations, and no on-site staff.

General Public Use Regulations (Section 550)—The following regulations set basic standards for protection of all Wildlife Areas and for the protection of public safety. In addition, the Regional Manager has authority to establish additional regulations that are not listed in sections 550 or 551. The regulations listed are currently applicable to all Wildlife Areas, including Knoxville. Where regulations require a specific action by the Department to be applicable (e.g., the designation of roads or trails), the status of any such action for Knoxville is noted in italics.

- The Department may specify entry locations, limit entry or close wildlife areas to protect resources or public safety. Specified public notice is required of such entry limitation or closure. *No entry locations, limitations or closures have been established at KWA.*
- Use permits are required for organized events or gatherings.
- Motor vehicles and trailers are not permitted except on public roads, parking areas or other trails designated by the Department. *No such trails or parking areas are yet designated (signed) at the KWA, however, three gravel parking areas have recently been constructed. Berryessa-Knoxville Road is the only public road through the KWA, and parking is available in the three lots and in numerous turn-outs along the road.*
- Drivers must comply with all traffic signs posted by the Department.
- Certain activities are not permitted. Prohibited activities include:
 - Damage or removal of property owned by others.
 - Depositing of litter, rubbish, or toxic substances.
 - Damage to plants, except vegetation may be cut for building blinds.
 - Removal of soil, sand, gravel, rock, etc.
 - Collection, disturbance or removal of bottles or artifacts.
 - Camping except in designated areas. *A camping allowance specific to the KWA is provided for in Section 551, subsection q(48, which states): "Camping allowed in designated areas. Primitive camping is allowed beyond one-quarter mile of designated parking areas."*
 - Open fires from April 30 through October 30.
 - Livestock grazing, except with a permit. *No grazing permits have been issued for the KWA.*
 - Taking fish or frogs for commercial purposes.
 - Possession of alcohol in all areas except designated parking areas.

- Hunting and fishing is permitted subject to regular open season and regulations and the special provisions of Section 551.
- Camping is limited to seven consecutive days, and not more than 14 days total in any calendar year.
- Dogs are allowed only for hunting or only when under immediate control. The Department may prohibit or restrict the use of dogs. The use of dogs for the pursuit/take of mammals or for dog training is also regulated pursuant to Section 265(a)(1)-(4). Section (4) states: the use of dogs for the pursuit/take of mammals or for dog training is prohibited from the first Saturday in April through the day preceding the opening of the general deer season in the Central California Dog Control Zone (Napa County north of Highway 128 and east of Highway 29; Lake County east of a line beginning at the Lake-Napa county line and Highway 29). *There are no additional restrictions on dogs at KWA.*
- The Department may eject a person from the Wildlife Area for specified reasons.
- Users are responsible for knowing area-specific regulations in Section 551.

Hunting, Firearms, and Archery Equipment and Permit Requirements (Section 551)—Section 551 contains regulations related to hunting and firearms, and also includes regulations that are specific to particular Wildlife Areas. Hunting and firearm regulations that apply to the KWA include the following:

- Except for designated shooting areas or with a special permit, possession and use of firearms and archery equipment is permitted only for hunting (i.e., no target shooting or "plinking"). *No shooting areas have been designated at the KWA.*
- Shotgun shells shall not contain shot size larger than BB in lead and size T in steel. Shotguns with slugs may be used for hunting big game.
- Loaded firearms are prohibited in parking lots.
- Raptors may be used to take legal game in accordance with general hunting regulations.

The only regulation specific to the KWA relates to camping: *"Camping allowed in designated areas. Primitive camping is allowed beyond one-quarter mile of designated parking areas."* The regulation is meant to allow primitive, walk-in camping (pack it in, pack it out) away from developed parking areas.

❖ Evaluation of Public Use Compatibility

Table 3 provides a list of activities at the Knoxville Wildlife Area for which there is current or potential public demand. This list was compiled from a variety of sources, including: (1) observations of public use by the authors during surveys of the KWA, (2) discussions with Department staff familiar with the KWA (primarily Phil Pridmore, Mike Lewis, Jim Swanson, and Tina Fabula), (3) discussions with members of the Trails and Recreation Committee of the BRBNA Conservation Partnership as well as other

interested partners, and (4) public input from two public input meetings held in 2003 (Appendix A).

The compatibility of particular uses was evaluated using five main criteria: (1) the degree to which the use is dependent on or related to wildlife, (2) the potential for the use to negatively impact wildlife habitat or wildlife populations, (3) the potential for conflict with other compatible uses, and (4) the level of management needed to support the use and the ability of the Department to provide the necessary resources, and (5) whether the activity is generally allowed under the framework of Wildlife Area regulations. Of the activities below, only the motorized use of vehicles in areas that are off-road or off designated trails is currently prohibited under Section 550.

Potential uses were classified based upon whether they are wildlife dependent (e.g., hunting, bird watching, wildlife photography), wildlife related (e.g., hiking), or not wildlife related (e.g., some forms of off-highway vehicle use). Some activities could fall under more than one category, depending on the objective of the participant. For example, bicycling and OHV use may be wildlife-related when used in support of hunting, but are generally not wildlife related when pursued as an end in themselves. Uses were further classified (low, moderate, or high) based on the degree to which they are likely to impact wildlife habitat, conflict with other uses, and demand resources from the Department (Table 3). Potential impacts to wildlife habitat were estimated from a review of the literature on the impact of outdoor recreation on natural environments.

Table 3. List of uses for which there is existing or potential demand at the Knoxville Wildlife Area, and classification for four criteria to determine whether uses are compatible with the Wildlife Area purpose. Compatible uses are listed in boldface type.

Use	Relation to Wildlife			Potential to impact habitat or wildlife	Potential to conflict with other uses	Required level of management
	Dependent	Related	Unrelated			
Wildlife observation and photography	X			low	low	low
Academic research	X			low	low	moderate
Environmental education	X			low	low	moderate
Hunting	X			moderate	moderate	moderate
Hiking		X		low	low	low
Primitive camping		X	X	moderate	low	moderate
Horseback riding		X	X	high	low	moderate
Bicycle riding		X	X	moderate	moderate	moderate
Off-highway vehicle use		X	X	high	high	high

In determining which uses are compatible with the purpose of the KWA, priority was given to wildlife dependent activities. To the extent that particular wildlife dependent activities have the potential to impact wildlife habitat or conflict with other uses management activities are proposed to minimize impacts and avoid conflicts. Secondary priority was given to wildlife related activities that have little potential to impact wildlife habitat or conflict with other uses, and which require low or moderate management support. Activities that are not wildlife related were considered incompatible with the purpose of the KWA.

Eight activities were determined to be compatible with the protection and enhancement of wildlife habitat. These activities are wildlife observation and photography, academic research, environmental education, hunting, hiking, primitive camping, horseback riding, and bicycle riding. Off-highway vehicle use was considered incompatible with the purpose of the KWA. It was also determined that horseback riding, bicycle riding, and primitive camping, because of their potential to negatively impact wildlife habitat or to conflict with other uses, should be restricted to certain portions of the Wildlife Area. These restrictions are designed to encourage users for which camping, bicycle riding, or horseback riding is secondary to or in support of wildlife related activities.

Wildlife observation and photography—The Knoxville Wildlife Area provides unique opportunities for wildlife observation and photography. The rugged Blue Ridge provides stunning views and unique floral displays, is a corridor for migrating raptors, and provides nesting sites for prairie falcons. In most places access to the Ridge itself is quite difficult due to steep terrain and dense vegetation. More typically, nature enthusiasts focus on the more rolling terrain of the oak woodlands, which is easily accessible by the existing system of old ranch roads, or the wildflower displays on serpentine soils, which are easily accessible from Berryessa-Knoxville Road.

Academic research—The Knoxville Wildlife Area provides important opportunities for pure and applied research. Much of the value of the KWA as a research site stems from its geographic position straddling the Stony Creek Fault (which defines the path of Knoxville and Eticuera Creeks). The Stony Creek Fault separates the sedimentary deposits of the Great Valley Sequence from the serpentine and related rocks of the Coast Range Ophiolite. This geologic heterogeneity produces diversity in plant and animal communities and provides unique opportunities to conduct research relating to the factors governing biological diversity. The Stony Creek Fault is also responsible for the hydrothermal systems that brought mercury to the region, which in turn has largely governed historic patterns of land use at the KWA. Likely fields for research at the KWA include wildlife ecology, stream ecology, restoration ecology, mercury cycling in the environment, plant ecology, evolutionary biology, and historic and prehistoric archaeology.

The Knoxville Wildlife Area also has high value as a field site for research and education because of its proximity to the University of California McLaughlin Reserve and its central location within the BRBNA. The McLaughlin Reserve, which abuts the northwest end of the KWA, is administered by UC Davis and is devoted to supporting

environmental research and university-level education both on the Reserve and within the greater Blue Ridge-Berryessa Natural Area. Because McLaughlin Reserve managers actively promote research and educational use of the Reserve and the surrounding area, it is likely that many research and educational use proposals will be submitted to the Department through the Reserve. Research proposals will be evaluated by the Department to ensure that they are consistent with the purpose of the KWA.

Environmental education—The KWA has high value as a site for environmental education for the same reasons that it is valued for research. Use of the KWA by K-12 school groups is probably limited by its remoteness and lack of amenities, but the KWA may be an attractive field site for university classes based at the McLaughlin Reserve. Proposals for class use will be evaluated by the Department to ensure that such use does not unreasonably impact wildlife habitat.

Interpretive displays or kiosks at key access points probably provide the greatest potential to educate the public about the unique geology, biology, and human history and prehistory of the KWA. Such displays or kiosks would likely combine interpretive material with regulatory and safety information. Production and maintenance of such displays would likely depend on an increase in funding and staffing for the KWA.

Hunting—Hunting is a primary public use provided for in the regulations governing Wildlife Areas. Deer and upland game bird hunting has been the primary public use at Knoxville over the past few years, and hunters were strongly represented at both public input meetings. There are no restrictions on hunter numbers at the KWA. At some Wildlife Areas the Department uses a permit system to regulate the number of hunters to manage wildlife populations or to minimize conflicts among hunters or between hunters and non-hunters. The Department has received no reports of conflicts among hunters or between hunters and non-hunters at the KWA, so the current system of unregulated access appears appropriate. In addition to the direct recreational benefit of hunting, regulated hunting provides the Department with a potential tool to manage wildlife populations or habitats.

Hiking—The KWA contains approximately 19.7 miles of old ranch roads, plus many miles more of unmapped ranch tracks and firebreaks. The Department currently maintains the main system of ranch roads in a condition for public access by foot and for dry season vehicular access by Department staff. The ranch roads provide easy foot access to all of the major drainages and ridges in the KWA, except for Blue Ridge, which lies mostly outside of the Wildlife Area. The existing road system also provides users with a number of loop routes, which vary in length, and provide the opportunity for day hikes that range from easy to strenuous.

A high priority concern in both public meetings was integrating the KWA into a regional trail system encompassing BLM lands to the north and BLM and BOR lands to the south. For example, the KWA could provide a linkage between a trail following the Blue Ridge and a trail into BLM's Knoxville Recreation Area. The ability to provide such a

linkage is severely constrained by the steep terrain and dense vegetation leading up to Blue Ridge. Potential routes will require careful evaluation to ensure that trails do not result in disturbance of sensitive wildlife (e.g., nesting prairie falcons), erosion, safety hazards, or unreasonable maintenance requirements.

Primitive camping—Current regulations allow camping more than 0.25 miles from designated parking areas. At this time the three parking lots are not formally signed. Most camping currently occurs during hunting seasons in the Berryessa-Knoxville Road right-of-way. High densities of roadside campers during deer hunting season leads to some localized accumulations of litter and human waste, which could be addressed by the temporary provision of portable toilets at popular camping sites.

In the absence of developed camping areas, the KWA is unlikely to attract much camping use except by hunters. The chaparral and oak woodlands provide few attractive camping sites due to the lack of clear and level ground. Development of permanent campgrounds is currently undesirable because of potential degradation of wildlife habitat (through vegetation trampling, firewood collection, and littering), and because permanent campgrounds have high maintenance costs. The Department will continue to allow primitive camping as an option to hunters and backpackers who would like the opportunity for more than just day use of the Wildlife Area.

Horseback riding—Horse riding is currently infrequent at the Knoxville Wildlife Area. Because of their high weight and relatively small area in contact with the ground, horses have potential to cause substantial environmental damage. Several studies have shown that horses can cause as much or even greater damage than motorcycles (Landsberg et al. 2001). Horses cause environmental damage directly by trampling vegetation and promoting soil erosion, but can also contribute to the spread of weeds. The potential for spread of weeds occurs because many seeds can pass unharmed through the digestive tracts of horses (sometimes as long as 13 days), and because many dried stock feeds are rich in weeds.

Horse impacts tend to be greatest off-trail or on trails that are steep or boggy, so environmental damage can be minimized by limiting horse access to relatively level maintained trails during the dry season. Limited trail riding for the enjoyment of the Wildlife Area, rather than specialized activities such as fast riding, racing, or cross-country events can be accommodated as long as environmental impacts remain minimal.

Bicycle riding—Like horse riding, bicycle riding has not become an established activity at the Knoxville Wildlife Area. The environmental impacts of mountain bikes, although hotly debated, are not well established. Some studies have shown that, compared to hikers, bikes have similar or even lesser effects on vegetation and sediment movement (Wilson and Seney 1994, Thurston and Reader 2001). Impacts from bicycles will depend largely on the style of riding, with the greatest impacts occurring during skidding, or when riding at high speed, in wet conditions, or off trail. While bicycles may

have less environmental impacts than horses, there is a widespread view that trail use by mountain bikes often conflicts with use by hikers and equestrians.

As with horses, bicycling can be accommodated as part of a wildlife-related activity, provided measures are taken to minimize environmental damage. Impacts of bicycles on the environment can be minimized with access restrictions that are identical to those for horses. Additionally the Department may consider speed restrictions on bicycles to increase safety and prevent conflicts with equestrians and pedestrian.

Off-highway vehicle use (incompatible)—Off-highway vehicles (jeeps, motorcycles, or four-wheeled all terrain vehicles [ATVs]) are currently prohibited at the Knoxville Wildlife Area under the general Wildlife Area regulations. Operation of such vehicles purely for sport is an activity that is unrelated to wildlife with great potential for environmental damage, and is therefore deemed incompatible with the purpose of the wildlife area. Off-highway vehicles can also be used to support hunting, which is a wildlife-dependent activity, and several participants in the public input hearings expressed interest in allowing increased vehicular access at the KWA for hunters, and particularly for hunters with limited mobility. For this reason the Department carefully considered the potential to increase off-highway vehicle access at the KWA for hunters.

Responsible use of off-highway vehicles on existing trails may have effects that are comparable to those caused by horses and hikers. At least one study has demonstrated that use of motorcycles or ATVs at low speeds on existing trails may result in even less sediment loss than use by horses and hikers (Wilson and Seney 1994). Studies of off-highway vehicle impacts off-trail have reached widely divergent conclusions, e.g., some showing that the effect of motorcycles is intermediate between hikers and horses (Weaver and Dale 1978, Weaver et al. 1979) and another concluding that one motorcycle pass has greater impact on vegetation than 500 pedestrian passes (Kutiel et al. 2000). Much of the discrepancy may be due to dependence of impacts on the vegetation and soil type. Despite conflicting experimental studies, there is widespread documentation of extensive vegetation damage and soil loss due to off-highway vehicle use (Brooks 1995, Lovich and Bainbridge 1999, Priskin 2003).

Much of the potential for off-highway vehicles to cause environmental damage stems from the ease (relative to equestrians and hikers) with which operators can establish new trails. This is particularly true in areas with extensive herbaceous vegetation. At KWA, even if off-highway vehicle access was restricted to existing trails, it would be difficult to prevent people from blazing new trails in grasslands, oak woodlands, and oak savannas. An additional impact of allowing off-highway vehicle access would be increased noise. Vehicle noise might not have direct effects on wildlife, but may diminish the quality of experience of other Wildlife Area users. Because of this potential for noise and because of the considerable environmental damage that might ensue in the absence of adequate resources to enforce regulations limiting vehicles to existing trails, at this time the Department has concluded that increased off-highway vehicle access for hunters is incompatible with the purpose of the KWA.

❖ **Coordination to Support Public Use**

The Knoxville Wildlife Area is part of mosaic of public lands within the Blue Ridge-Berryessa Natural Area, and management to support compatible public uses of the Wildlife Area will require coordination with other entities—particularly the Bureau of Land Management, the University of California, and the BRBNA Conservation Partnership. Coordination will be particularly important for regional trail planning, providing access to and from the Wildlife Area, accommodating overnight camping in the region, and for ensuring regulatory consistency (to the degree possible) between public lands managed by different agencies.

Regional trail planning—A planning program for a regional trail system in the Blue Ridge Berryessa Natural Area was recently initiated by the Trails and Recreation Committee of the BRBNA Conservation Partnership. The Department will work with the Committee, BLM, and the McLaughlin Reserve to determine whether the existing network of ranch roads within the KWA could be integrated into this plan. The Department will also work with the Committee to determine specifically if there are any acceptable routes through the KWA by which a Blue Ridge trail could be linked to BLM's Knoxville Recreation Area.

Unauthorized access—Access and trail planning are closely linked, however two separate access issues require coordination with BLM and the McLaughlin Reserve. The northern boundary of the KWA, which abuts land administered by the BLM, is neither signed nor fenced. A seasonally accessible BLM road runs near this boundary and has been the source of unauthorized off-highway vehicle incursions into the KWA. The Department needs to work with the BLM to resolve this problem. The border between the KWA and the McLaughlin Reserve is also unsigned and unfenced. The McLaughlin Reserve is open to access by application only. As use of the KWA increases, trespass onto the Reserve is also likely to increase. Coordination with the Reserve is required to find means to minimize trespassing.

Additional camping—The capacity of the KWA to provide opportunities for camping is limited, but the demand for camping sites is likely to increase as use of the KWA increases, particularly during hunting seasons. A viable alternative to increasing camper capacity at the KWA may be to redirect campers to sites on adjacent BLM land.

Regulatory consistency—Regulatory consistency between the KWA and other public lands in the region may be a limited possibility because the mission of the Department and the purpose of the KWA differ from those of other agencies. In particular the Department, unlike the BLM, has no mandate to manage for multiple uses, and instead must emphasize the protection and enhancement of wildlife habitat. Nevertheless, regulatory consistency (e.g., with respect to dogs, bicycles, horses, shooting) should be considered in any planning of trails that traverse public lands managed by different agencies. If regulatory consistency is not possible then it will be important to make users aware of regulatory changes as they pass between different types of public land.

❖ Management to Support Public Use

Proposed management activities to support compatible public uses are grouped into five categories: (1) public information and outreach, (2) access improvements, (3) hunting and wildlife, (4) facilities, and (5) research and education. Management goals and tasks are described in detail in Chapter VI, and are summarized briefly here.

Public information and outreach—Ensuring that only appropriate public use occurs at the KWA currently depends on informed user groups and a responsible public. The Department of Fish and Game's Lands and Facilities website at www.dfg.ca.gov/lands/ currently provides only cursory information on how to find the KWA. The regional office provides a general topographic map with the KWA's specific regulations to callers requesting such information. Other than Wildlife Area boundary signs and several No-Vehicle signs, information on allowable activities at the KWA is lacking. Oversight of prohibited uses is limited to the infrequent patrols of Fish and Game Wardens. Improving the existing information channels by increasing information at the Wildlife Area and on the Department's website will help the public understand appropriate use of the Wildlife Area.

Access improvements—Public access into and through the KWA was a high priority issue at both public input meetings. The goal of the Department is to improve public access for compatible uses, while protecting sensitive plant and animal populations and archaeological sites. The Department will discourage trespass or poaching on adjacent private lands and integrate the KWA into a regional trail system, provided that such integration can be accomplished without threatening sensitive plant and animal populations and without encouraging an unsustainable level of public use. To the extent funding and staffing allow; management actions may include:

- Maintenance of the existing system of ranch roads.
- Installation of additional access points in the fence along Berryessa-Knoxville Road.
- Installation of boards or kiosks with regulatory, safety, and interpretive information.
- Working with BRBNA and other groups to identify potential regional trail routes.
- Identification of trail segments and times of year in which bicycles and horses may be permitted.

In compliance with federal and state law, the Department will evaluate the provision of accommodations for disabled persons within its programs and facilities.

Hunting and Wildlife—The Department is committed to providing long-term opportunities for hunting and to restoring or improving wildlife habitat to increase the potential for wildlife-related and wildlife-dependent activities at the KWA. Specific management actions may include:

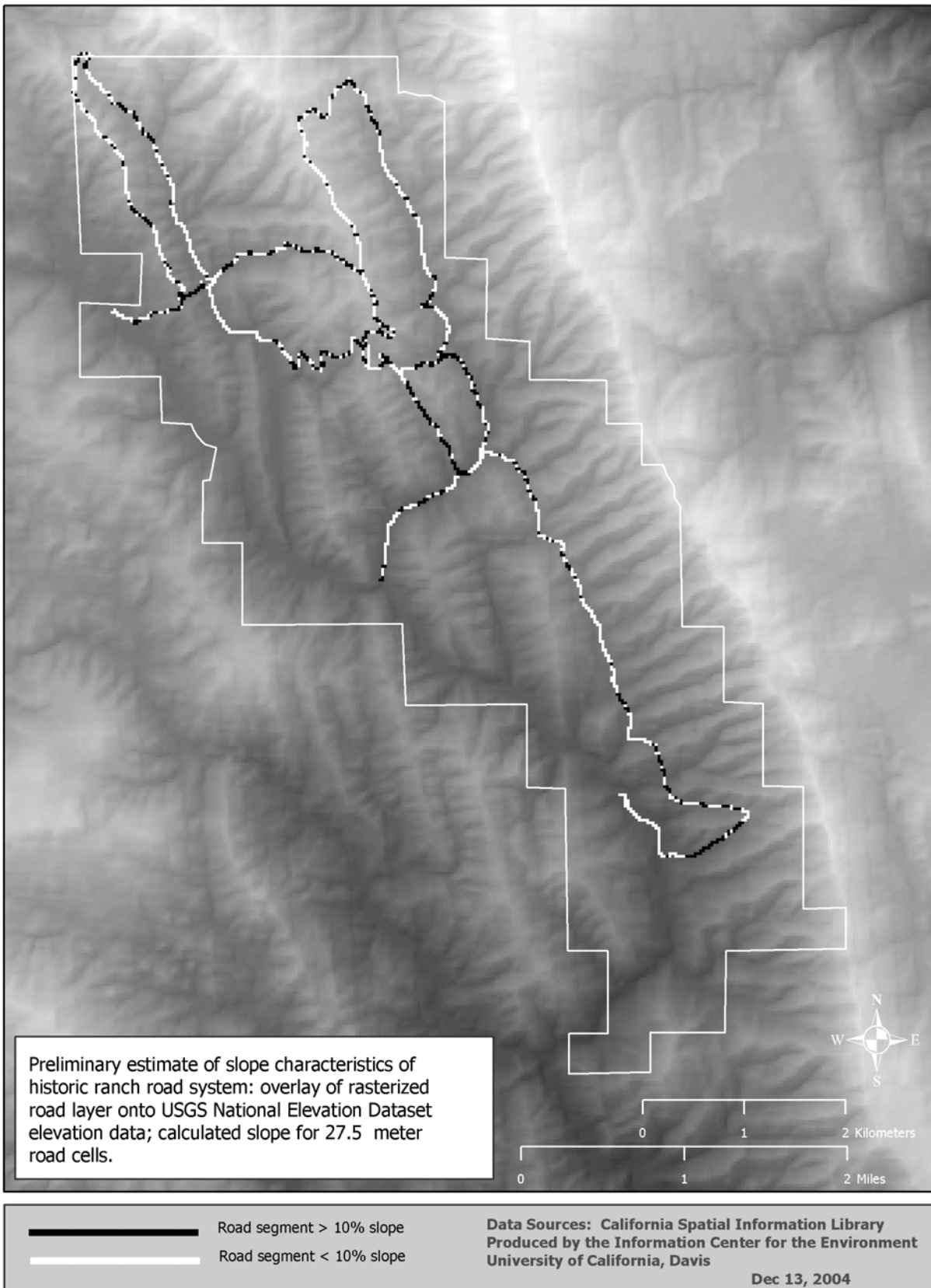
- Managing existing vegetation or planting new vegetation to support game as well as non-game wildlife populations.
- Monitoring use patterns and periodically evaluating the need for designated hunting zones or entry permits.
- Evaluating the feasibility of implementing junior turkey hunts or other special hunt opportunities.

Facilities—The KWA currently offers limited facilities; three graveled parking areas have been constructed along the Berryessa-Knoxville Road. Day and overnight use could be improved by formalizing the parking areas, providing restroom facilities, and considering additional types of camping. The Department will support limited opportunities for camping to the extent that such use has negligible impacts on natural and cultural resources. To the extent funding and staffing allow; the Department may:

- Clarify the regulations regarding camping at the KWA.
- Provide portable sanitation at heavily used camping sites along Berryessa-Knoxville Rd. during deer season (rifle).
- Coordinate with the BLM to encourage campers to use the Hunting Creek Campground or other sites within the Knoxville Recreation Area.
- Consider allowing in-vehicle overnight camping at one of the KWA parking lots in addition to supplying restroom facilities.

Research and Education—The Department will promote research and educational use of the KWA, and in particular will encourage and support research that will assist in the Department's management of the area and its wildlife. Managers of the adjacent University of California McLaughlin Reserve actively promote environmental research and university-level class use in the region, and the Reserve provides housing and lab facilities for field workers. The McLaughlin Reserve could directly benefit the Department by serving as a support facility for research and class use of the KWA. The Department may work with University to develop an agreement (MOU) to streamline review of projects that involve Reserve land and the KWA.

Figure 5: Historic ranch road system on the Knoxville Wildlife Area indicating road segments with >10% slope



VI. MANAGEMENT GOALS AND TASKS

❖ Definition of Management Terms

Consistent terminology is used by the Department for clarifying management goals. To acquaint the reader with this terminology, the following terms and meanings are established for use in this Plan.

- **Element:** Any biological unit, public use activity, facility maintenance or management coordination program as defined below for which goals have been prepared and presented within this Plan.
- **Biological Element:** Any vegetation type, plant community, habitat, or species for which specific management goals have been developed within this Plan.
- **Public Use Element:** Any recreational use or other activity appropriate to and compatible with the purposes for which this property was acquired.
- **Facility Maintenance Element:** Any maintenance and administrative program that helps provide for orderly and beneficial management of the Wildlife Area.
- **Management Coordination Element:** Any management program that involves coordination with entities outside of the Department, such as the Blue Ridge-Berryessa Natural Area Conservation Partnership, BLM, the University of California, and other public and private entities with an interest or a management role in the region.
- **Biological Goal:** A statement of the intended long-range results of management to enhance, restore, or control any biological element.
- **Public Use Goal:** A statement of the desired type and level of public use compatible with the biological goals previously specified within this Plan.
- **Management Coordination Goal:** A statement of the desired type and level of management coordination that is required to achieve the biological and public use goals previously specified within this Plan as well as the greater goals of the Blue Ridge-Berryessa Natural Area Conservation Partnership.
- **Tasks:** A specific project necessary to achieve a goal and which is useful to define for purposes of planning operation and maintenance budgets.

The management program is organized into elements, goals and tasks, which establish a hierarchy of management direction for the Wildlife Area. *Elements* define the broad

categories of consideration, *goals* define objectives within the *elements* and *tasks* establish specific actions to attain the *goals*. Elements themselves are somewhat hierarchical, with broader categories of consideration (e.g., the watershed) listed before specific ones (e.g., priority vegetation types). Together the elements, goals and tasks express the policy direction that will guide the management of the Wildlife Area.

❖ **Biological Elements: Goals and Management Constraints**

This Plan adopts an integrative ecosystem approach to resource management and as a result biological elements are defined broadly. The approach is based on the principle that maintaining a healthy ecosystem is the most efficient way to ensure healthy populations of native wildlife, including rare and sensitive plants and animals and game species. The four biological elements addressed in this Plan are as follows:

1. Knoxville-Eticuera Creek ecosystem and watershed.
2. Priority vegetation types: serpentine, riparian, and grasslands and oak woodland understory.
3. Special status species: plant and animal.
4. Game species.

Biological Element 1: Knoxville-Eticuera Creek ecosystem and watershed.

Ecosystems function through a number of processes that involve both biotic and abiotic components, including:

- the cycling of water and nutrients through the environment.
- primary production via photosynthesis and transfer of energy through food webs.
- the maintenance of native biodiversity through natural interactions among species (e.g., competition, pollination, herbivory, parasitism, and predation) and
- natural disturbance regimes such as fire and flooding and wind fall of trees.

A number of threats to healthy ecosystem function at the KWA have already been identified in this plan. Foremost is the threat posed by invasive plant species such as tamarisk, arundo, and perennial pepperweed. These species have the potential to dramatically alter ecosystems and to replace entire communities of native plants and animals. They do so by competing directly with native plant species, by changing stream flow dynamics and soil chemistry, and by forming monotypic stands that provide habitat for few wildlife species. Secondary threats to healthy ecosystem function at the KWA include unnatural disturbance regimes, such as inappropriate fire frequency (either a decrease in fire frequency due to fire suppression, or an increase due to human ignition), improper grazing techniques, and increased soil erosion and stream

channelization. Unfortunately, unnatural disturbance regimes frequently interact with invasions by exotic species in positive feedback loops. For example, invasion by grasses into shrubland can increase the potential for fires, and increase in fire frequency may further facilitate the invasion.

The primary mechanisms by which the Department can maintain healthy ecosystem function at the KWA is through control of invasive species, maintenance of natural disturbance regimes, and maintenance of natural species diversity and interactions.

Biological Goal 1.1. Monitor critical aspects of ecosystem function.

Maintenance of healthy ecosystem function at the KWA requires an initial assessment of threats to ecosystem function to establish management goals and priorities. Much of this initial assessment, particularly with respect to invasive species, has been completed as part of this Plan. In addition This Plan proposes an adaptive approach to the management of the KWA. Adaptive management is a process by which the Department modifies management goals and tasks in response to new information. Threats to the ecosystem, as well as the success of management actions, require periodic reassessment so that management priorities and techniques can be adjusted for maximum effectiveness. This reassessment can be accomplished with a monitoring program that targets likely threats to ecosystem function and important indicators of ecosystem health.

Task 1.1.1. Inventory to identify and map invasive species that are likely to have severe impacts on ecosystem function and to establish a baseline against which to assess future condition. Between August 2003 and August 2004, personnel from UC Davis (Paul Aigner, Catherine Koehler, Jake Rugyt) conducted surveys for invasive species in California annual grasslands and in riparian zones within the KWA. These surveys targeted a subset of the priority species included in Table 2, including yellow starthistle, barbed goat grass, perennial pepperweed, Harding grass, Italian thistle and bull thistle (Appendix B). These surveys were limited to areas mapped as California Annual Grassland on the Napa County MCV vegetation map, and to the major riparian corridors along Foley, Knoxville, and Elicuera Creeks. The surveys also identified areas with relatively dense cover of native bunchgrass (primarily *Nassella* spp.), which can be used as seed sources or starting points for grassland restoration.

Task 1.1.2. Design and implement a program of long-term vegetation monitoring at the KWA. The primary objective of a vegetation monitoring program at the KWA is to provide information about the spread of important invasive species. Inventories will be conducted on a regular basis to map additional weed species that were not included in this initial round of mapping, to monitor the appearance of new weed populations, to distinguish small satellite populations from large infestations, and to monitor the spread or treatment of large infestations. Inventory techniques will depend on the target species, but will usually rely on ground mapping in the field. If resources permit, vegetation monitoring may be

expanded to include secondary goals, such as assessing the status of priority vegetation types or special status species.

Task 1.1.3. Design and implement a program to monitor the success of management activities.

Task 1.1.4. Continue photo monitoring of tamarisk eradication along Knoxville and Eticuera Creeks. Prior to the start of tamarisk eradication along Knoxville and Eticuera Creeks, permanent photo monitoring points were established throughout the treatment area. These monitoring points are visited once or twice a year by UC personnel. The resulting series of photographs establishes a record of vegetation response to tamarisk removal.

Biological Goal 1.2. Eradicate new introductions to help stop the spread of non-native species.

There is virtual consensus among scientists and land managers that early detection and prevention is crucial when it comes to combating the spread of weeds (Mack et al. 2000). Once a large-scale invasion occurs, eradication, control, and restoration are expensive, time-consuming, and difficult endeavors.

Task 1.2.1. Monitor frequently traveled routes at the KWA for new invasions and target those areas for priority eradication (e.g. sites along roads, trails, streams, near buildings/parking areas, in turnoffs, etc.). Monitoring should also be conducted in each hot list weed species' preferred habitat.

Task 1.2.2. Clean vehicles and clothing after leaving infested areas and before entering un-infested habitats. To the extent possible heavy equipment and vehicles used by the Department for maintenance and other administrative functions within the KWA will be cleaned prior to entering and after leaving the KWA. This is particularly important if the vehicles have been used in other areas with invasive species that have not yet established at the KWA.

Task 1.2.3. Provide education and outreach. An important component of prevention will be to provide outreach to educate KWA users as to measures they can take to prevent introducing invasive species at the KWA. Such outreach could take the form of flyers or handouts at kiosks along Berryessa-Knoxville Road

Biological Goal 1.3. Eradicate existing small populations of invaders.

KWA currently has small infestations of several invasive weeds, such as perennial pepperweed, bull thistle, and yellow starthistle. Many of these satellite infestations are small enough (e.g., < 25 m²) to be eradicated. Eradicating a satellite population is always more cost-effective than controlling a large infestation.

Task 1.3.1. Eradicate satellite infestations of “hot-list” species. Hot list species (Table 2) that occur in less than 20 places on the KWA; as well as infestations of invaders that may be widespread in some portions of the KWA, but are only beginning to invade other portions should be eradicated annually or as resources permit.

Biological Goal 1.4. Control and manage existing infestations of established invaders.

In some areas of the KWA, the larger invasions are too advanced to be eradicated (e.g., yellow starthistle and Harding grass). Such infestations should be controlled and managed to (1) prevent their expansion and spread, and (2) gradually shrink them. When resources permit, such areas should be targeted for restoration measures such as controlled burns and native reseeding, following the best available scientific advice (e.g., DiTomaso et al. 1999).

Task 1.4.1. Identify non-native species that have invaded the KWA, and prioritize management of particular weed species based on potential impacts to ecosystem function and feasibility and impacts of control. Non-native species that have invaded the KWA are identified in Table 2. Prioritization of management actions for these species is developed in Appendix I. Highest management priority is given to infestations (1) that pose the greatest threat to priority vegetation types and weed management goals, (2) that remain localized or otherwise sparsely present on the KWA, and (3) for which feasibility of eradication or control is greatest.

Task 1.4.2. Determine appropriate prevention, eradication, and control options for priority weed species. Potential eradication and control options for hot-list species that already occur at the KWA are presented in Appendix I. Prevention, eradication, and control options will also be developed for hot-list species that have not yet invaded the KWA.

Task 1.4.3. Implement species-specific weed management tasks in Appendix I.

Task 1.4.4. Evaluate the effectiveness of current methods and adjust methods as needed. Data from weed inventories should be utilized to carefully monitor and assess the effectiveness of current methods. The results will be used to modify and improve control priorities, methods, and planning. Where necessary, monitoring efforts may be needed to establish new goals.

Biological Goal 1.5. Develop and implement an integrative, watershed level weed management plan for the Knoxville and Eticuera Creek watersheds.

It will be difficult to prevent the continued introduction and spread of noxious weeds if neighboring landowners do not have the same management goals as the Department. Over the long term, the Department's costs for weed management will be less if cooperative ventures can be initiated to manage weeds at the watershed scale.

Task 1.5.1. Coordinate weed management with neighboring property owners and land managers. Weed control will be most efficient and economical if infestations on neighboring properties, such as the McLaughlin Reserve, BLM Knoxville Recreation Area, and Lauff Ranch are eradicated and controlled, and monitoring is sufficient to prevent the invasion and spread of new weed species. One possible solution is for all neighboring landowners in the area to work cooperatively by having monitoring and eradication conducted by the same entity. Such a “Berryessa-Knoxville weed management group” could meet to discuss strategy both in the winter or spring before weed control is enacted, and in the summer or fall after weed control and monitoring activities for the growing season have been completed. Such coordination could take place under the auspices of the BRBNA Conservation Partnership or the Napa County Weed Management Area (which is currently being organized).

Biological Goal 1.6. Restore native species and plant communities to increase resistance to and resilience against invasion.

Restoration measures may include reintroductions of native species, eradication and control of invasive species, inoculations with soil biota important to native plant vigor, nutrient cycling, and decomposition (e.g., mycorrhizae, found by Edgerton-Warburton and Allen (2000) to be important to the recovery of native bunchgrass species), and restoration of native disturbance regimes (Soulé and Terborgh 1999). Such measures are important to effective weed management because native abundance may increase resistance to invasion, especially at the scale of an individual patch of plants (Levine et al. 2002, Gelbard 2003). For example, plots dominated by established monocultures of the native perennial grass, *Nassella pulchra*, along with the late season annual forbs, hayfield tarweed (*Hemizonia congesta*) and woolly-headed lessingia (*Lessingia hololeuca*) resisted invasion by yellow starthistle (Dukes 2002). These species, like starthistle, complete their life-cycles late in the growing season and utilize deep soil moisture, suggesting that plant communities are most resistant to invasion where they contain a high abundance of native species with similar life-history characteristics to introduced exotics (Roché et al. 1994, Enloe et al. 2000, Dukes 2001, 2002).

The vast area of grassland and oak woodland habitats that are currently degraded on the KWA makes restoration a daunting task. In areas where exotic annuals have overrun large areas, a long-term, multi-pronged strategy involving restoration of the native disturbance regime (including by letting natural fires burn, conducting prescribed burns, and maintaining native grazing regimes), re-introductions of native species and soil biota, and eradication or control of invasive species will be needed (Soulé and Terborgh 1999, U.S. Bureau of Land Management 1999).

Task 1.6.1. Continue planting of native woody species (willows and cottonwoods) along upper Knoxville Creek.

Biological Goal 1.7. Maintain natural fire frequency, seasonality, and intensity with fire suppression or prescribed burning as necessary.

Task 1.7.1: Conduct research on the fire history of the KWA to estimate historic and prehistoric fire frequencies.

Task 1.7.2: Coordinate with the California Department of Forestry and Fire Prevention to develop a wildland fire response plan and prescribed burn plan for the KWA.

Task 1.7.3: To insure the proper implementation of the fire response plan, designate Department staff members with responsibility to coordinate with incident commanders and on the ground fire crews in the event of a wildfire at the KWA.

Biological Goal 1.8. Maintain or simulate natural plant-herbivore interactions.

Task 1.8.1: Consider reintroduction of native grazers (i.e., elk).

Task 1.8.2: Consider using carefully managed cattle grazing to promote native grasses and forbs and to control non-native invasive species. The Department's goals for a grazing program would be to improve the existing wildlife habitat or to improve the native to non-native plant species ratio. An outline of a managed grazing program follows:

Management Goals of grazing at the Knoxville Wildlife Area

1) Reduce cover of non-native species by grazing in places where they dominate: Grazing can reduce the amount of thatch and seed set from annual grasses and can increase the presence of native forbs. For example: grazing at KWA could concentrate animals in the large areas of medusa-head that exist near Berryessa Knoxville Road.

2) Reduce fuel loads

Grazing can reduce the fuel loads created by non-native annual grasses.

Potential impacts from grazing and mitigations for those impacts:

1) Protection of sensitive habitats and/or sensitive species - Knoxville-Eticuera creek contains several species of amphibians and the western pond turtle (CDF sensitive species). In addition, the banks of Knoxville-Eticuera creek are currently re-vegetating with native shrubs and trees after the removal of tamarisk. If grazing is used as a vegetation management tool, livestock damage to the riparian areas along Eticuera Creek, Long Canyon, Foley Canyon, and other sensitive areas will be managed through selective fencing or livestock management techniques such as strategic placement of water troughs and salt licks.

2) Potential Human and Livestock Conflicts - The presence of livestock and livestock fencing can impede access by hunters and other public users, but this should not be big problem.

3) Potential Wildlife and Livestock Conflicts - The presence of livestock and livestock fencing could affect the movement of some wildlife species. Grazing locations and intensity would be managed to ensure that game and wildlife species would not be negatively affected. Livestock fencing would be designed to not impede wildlife movement.

4) Potential for reducing oak tree regeneration - Livestock can reduce the reproduction of oaks, particularly blue oaks and valley oaks, which occur at KWA. If grazing is used as a vegetation management tool, areas where oak regeneration or oak restoration is desired should be protected by exclosures, and selective planting should be considered.

Practical issues to address in a Grazing Plan:

- Economics of intensive management requirements
- Timing of grazing (seasonality)
- Animal movement required (on to, off of, and within sites)
- Fencing (placement, construction, maintenance, and security of)
- Predators
- Secure fencing
- Water sources (location, quantity, etc.)
- Site access and loading/unloading sites

Considerations for Range Management Consultant:

- Kind and class of animal to achieve vegetation management objectives (sheep, cattle, heifer, etc.)
- Grazing capacity of sites (AUMs)
- Timing of grazing to favor target desirable species and minimize damage
- Timing of grazing to reduce target exotic species
- Amount of biomass removal to meet objectives for various species
- Infrastructure needs of livestock operator
- Infrastructure needs for resource protection

Task 1.8.3: Consider introducing wildlife forage in plots in appropriate areas to enhance or maintain viable populations of game species (quail, deer, turkey, or dove).

Biological Goal 1.9. Maintain natural sediment movement through the watershed by mitigating unnatural erosion and by allowing natural stream bank dynamics in Knoxville and Eticuera Creeks.

Task 1.9.1: Identify and prioritize human-induced sources of erosion (e.g., dams, roads, trails, and firebreaks).

Task 1.9.2: Abate high priority erosion sources with earthmoving and by revegetating with native species as necessary.

Biological Element 2: Priority vegetation types.

High priority vegetation types at the KWA are those that harbor a disproportionate fraction of biodiversity, particularly of rare or endemic species, are particularly susceptible to invasion by non-native species, or have been particularly degraded by past human disturbance and invasion by non-native species.

Biological Goal 2.1: Protect and restore native species biodiversity in priority vegetation types including: (1) serpentine chaparral containing seeps and barrens, (2) riparian areas, and (3) native grasslands and oak woodlands.

Task 2.1.1. Continue and expand implementation of control or eradication plans for the three highest priority invasive species: tamarisk, yellow starthistle, perennial pepperweed.

Task 2.1.2. Develop site specific removal areas and control plans for the medium priority invasive species: tocalote, bull thistle, Italian thistle, and Harding grass.

Task 2.1.3. Continue to develop and implement plans for restoration of native plant communities with particular focus on expanding the cover of native bunch grasses, oaks, and woody riparian species.

Biological Element 3: Special status species: plant and animal.

Special status plant species occur in a variety of vegetation types at the KWA. Most special status plants occur on serpentine substrates in grasslands, seeps, or rock outcrops (barrens). Most populations of special status plants have been relatively free from damage by human activity or invasive species and do not require active management. Management for special status plants will focus on preventing future negative impacts to populations.

Special status animals include species that rely on streams, woodlands, chaparral, and rock outcrops. For example, foothill yellow-legged frogs rely on open, rocky stretches of stream with riffles and sunny banks. Western pond turtles prefer deep slow moving water in creeks and ponds. Sage sparrows nest in both serpentine and non-serpentine chaparral, and prairie falcons nest in the sandstone bluffs on the west face of Blue Ridge.

Priority vegetation types were defined in part by their diversity of special status species, so management actions that protect and restore native biodiversity in priority vegetation types should also provide protection for most special status animal species.

Biological Goal 3.1. Protect and enhance habitat for special status plant species.

Task 3.1.1. Direct public use activities away from serpentine rock outcrops (barrens) or other areas that harbor special status plants.

Task 3.1.2. Periodically visit populations of special status plants to assess overall habitat integrity and to detect the appearance of non-native species.

Biological Goal 3.2. Protect and enhance habitat for special status animal species.

Task 3.2.1. Improve stream habitat for foothill yellow-legged frogs. Foothill yellow-legged frog habitat can be improved by maintaining and increasing stretches of creek with native vegetation and by removing unnatural sources of sediment input. Efforts will focus on the upper reaches of Knoxville Creek where flows are perennial and frogs have been observed. Weed control and restoration measures should focus on removing invasive riparian species such as tamarisk and perennial pepperweed that dominate the streambank and crowd out native riparian species in these areas.

Task 3.2.2. Improve and protect upland breeding habitat for Western pond turtles by locating and protecting nesting areas.

Task 3.2.3. Improve pond and stream habitat for western pond turtles by maintaining and repairing the largest of the existing stock ponds and by continuing tamarisk eradication along Knoxville and Eticuera Creeks.

Task 3.2.4. Monitor the fire frequency in chaparral habitat where sage sparrows occur. Explore ways to implement control burns that produce a patchwork of various successional stages but that does not facilitate invasion of non-native grasses. Set up bird census routes to monitor sage sparrows and chaparral bird species in general.

Task 3.2.5. Route regional trails within the KWA away from sandstone bluffs to protect prairie falcon breeding habitat.

Biological Element 4: Game species.

Biological Goal 4.1: Protect and enhance habitat for game species.

Task 4.1.1. Improve existing or create new water sources for game species and wildlife populations in general.

Task 4.1.2. Monitor fire frequency to maintain habitat suitable for healthy game species and wildlife populations.

Task 4.1.3 Maintain or improve food sources for game species. This may include planting, disking, mowing or other habitat management practices.

Biological Goal 4.2: Maintain healthy and productive deer populations.

Task 4.2.1. Establish desirable and biologically sound deer population components.

Task 4.2.2. Periodically inventory deer population components including population size, sex ratio, age structure, and harvest levels.

Task 4.2.3. Periodically determine optimal annual deer harvest to maintain a healthy and productive population. Manage hunting effort to achieve optimal deer harvest.

Task 4.2.4. Periodically inventory the quantity and quality of deer habitats on KWA.

Task 4.2.5. Manage vegetation and available water to promote high quality habitats for deer.

Biological Goal 4.3: Maintain healthy and productive turkey populations

Task 4.3.1. Periodically inventory the quantity and quality of turkey habitats on KWA.

Task 4.3.2. Manage vegetation and available water to promote high quality habitats for turkeys.

Management Constraints on the Biological Elements—The goals of the biological elements are constrained by a range of natural and human-induced factors. Effective management of the wildlife area requires that these factors be identified and considered. This plan recognizes that the Wildlife Area exists within the context of conflicting values and needs that are important to the neighbors of the Wildlife Area, the users of the Wildlife Area, and the people of California in general. Factors that affect the ability of the Department to attain the Biological Element goals include:

Environmental factors

- Proper ecosystem function has been impaired by a history of human impacts extending back at least 150 years. Many of these impacts are irreversible including channelization and erosion of the Knoxville and Elicuera Creek stream

course caused by the construction of Berryessa-Knoxville Road and by extensive earth movement at the Knoxville town site.

- Many invasive species have become integrated into the California flora. Certain non-native annual grasses and forbs will always be present in grasslands, the oak woodland understory, and along riparian corridors.

Legal, political, or social factors

- Watershed-scale management will be constrained by the willingness or ability of other public land managers and private landowners to cooperate. Private land owners may place values on their land that conflict with the goal of healthy ecosystem function. Other public land management agencies have missions and goals that differ from the Department. For example, managers of BLM land will need to consider a multiple-use mandate that provides for commercial uses (e.g., mining or wind energy development) of the land.

Financial factors

- Limited funding for staffing and operations is the greatest existing management constraint for the Wildlife Area. This Plan proposes management actions that would require an increase in funding.

❖ **Public Use Elements: Goals and Management Constraints**

Public Use Element 1: Compatible public use.

The overarching public use element is termed "compatible public use." Compatible public use refers to all uses that are consistent with the mission of the Department and the California Code of Regulations, Title 14, the purpose of the Wildlife Area, as well as goals for biological elements. These uses are generally low-impact recreation activities defined in Chapter V, and include such activities as hiking, hunting, wildlife observation/photography, primitive camping, and limited horseback and bicycle riding. Compatible public uses may also include limited academic research and environmental education.

Compatible public uses have been allowed since the acquisition of the KWA, but information about the availability of and restrictions on recreation opportunities have not been readily available to the public. This Plan proposes the restriction of certain uses such as bicycling and horse riding to a limited number of designated ranch roads (routes have yet to be chosen). These new regulations will increase the importance of informing the public about compatible uses and their appropriate location at the KWA. Making information available to the public in multiple forms, and combining information with that provided by other public agencies with land in the region will maximize effectiveness of outreach efforts.

Public Use Goal 1.1: Support compatible public uses and reduce or prevent incompatible uses with public outreach, signage, and regulations.

Task 1.1.1. Identify compatible public uses with signage at major access points to the KWA and on the Department web site.

Task 1.1.2. Develop a topographic map of the KWA that includes existing ranch roads, and make available on the Department web site and at major access points to the KWA.

Task 1.1.3. Coordinate with other agencies in the BRBNA to develop a BRBNA recreation brochure and map delineating land management units and allowed uses within these units.

Task 1.1.4. Identify appropriate trails at the KWA for bicycle and equestrian use. Install signage to indicate open trails (all routes not designated as open for bicycle and equestrian use should be considered closed to such use).

Task 1.1.5. Review goals of this plan to ensure they are compatible with the regulations of the Department and Wildlife Area use in general.

Public Use Element 2: Public access.

A goal of the Department is to improve public access for compatible uses of the KWA. Currently, access to the KWA from Berryessa-Knoxville Road is provided by the system of roads developed when the KWA was used for cattle grazing. In many places, access from Berryessa-Knoxville Road is hindered by barbed wire fencing that was originally installed to contain cattle. The KWA is also accessible from a BLM road that runs near its northern boundary. Several overgrown firebreaks and old roads provide routes from this road into the KWA. These routes are used by people on foot and also occasionally by off road vehicles. The boundary of the KWA is not indicated at these access points.

The Department has concluded that the existing system of ranch roads provides an adequate trail system for compatible public uses within the KWA, so expansion of opportunities for public access will primarily entail improving access from public roads to the existing system of ranch roads within the KWA. Additional trail development, particularly on the steep and densely vegetated slopes leading up to Blue Ridge would be incompatible with the biological goals of this Plan (i.e., they would promote erosion and provide corridors for introduction of invasive species). Currently, there is interest within the BRBNA Conservation Partnership in developing regional trails within the BRBNA, which could cross the KWA. The Department will cooperate in planning such a trail systems and will focus on using existing routes (ranch roads or firebreaks) within the KWA as part of this system.

Public Use Goal 2.1: Maintain and expand opportunities for appropriate public access.

Task 2.1.1. Maintain the existing system of ranch roads.

Task 2.1.2. Identify locations for and install additional entry points for foot, horse, and bike access in the barbed wire fence along Berryessa-Knoxville Road.

Task 2.1.3. Improve access from the BLM road along the north boundary of the KWA, and add signage to indicate the KWA boundary.

Task 2.1.4. Work with the BRBNA Conservation Partnership and interested public groups to identify potential regional trail routes through the KWA.

Public Use Element 3: Hunting and other wildlife-dependent recreation.

Hunting is a primary use of the KWA. The Department is committed to providing long-term opportunities for deer and upland game hunting at the KWA as well as to increasing opportunities for other wildlife-dependent recreation (e.g., photography, bird watching).

Public Use Goal 3.1: Provide long-term opportunities for hunting.

Hunting pressure at KWA mainly consists of deer and turkey hunting. However, opportunity also exists for rabbits, quail, dove, squirrels, coyotes, bobcats, and gray foxes. Because KWA is relatively near large urban areas, there exists the potential for high levels of use during the opening of deer season and during spring turkey season.

Task 3.1.1. Evaluate the need and feasibility of implementing special hunts. Implement special hunts if feasible.

Public Use Element 4: Public use facilities.

Public Use Goal 4.1. Evaluate the feasibility of, and the need for improved facilities to provide amenities (such as more parking areas and/or primitive toilet facilities) for day and overnight use. Provide limited opportunities for camping.

Task 4.1.1. Consider the potential for overnight vehicle camping at the KWA parking areas. Clarify the existing regulations to indicate that primitive camping is permitted beyond one quarter mile of Berryessa-Knoxville Road, not just the parking areas.

Task 4.1.2. Explore the feasibility of installing permanent primitive restrooms at one or more parking lots.

Public Use Element 5: Scientific research and monitoring.

Scientific information forms the basis for good management decisions at the KWA. The Department can improve its management of the KWA by conducting its own research and monitoring at the KWA, and by soliciting partnerships with academic institutions.

Because of its proximity to the UC Davis–McLaughlin Reserve, the KWA has potential to serve as a field site for academic research and instruction in the environmental sciences. The Department will consider supporting academic research that is compatible with the biological goals and other public use goals of this Plan, whether or not the proposed research pertains to the management of the KWA. The Department recognizes that research projects may have impacts on biological and public use elements of the KWA, as well as on the potential to conduct future research. The potential impacts of research projects will be specific to each project, so the Department will evaluate the compatibility of proposed research projects based on the following criteria:

- potential for research results to improve management of the KWA or other wildlife areas.
- potential conflicts between the research and compatible public uses.
- potential conflicts between the research and any biological goals stated in this Plan.
- potential for the research to interfere with or preclude certain types of future research at the KWA.
- potential contribution of the research to science and society.

Public Use Goal 5.1: Support appropriate scientific research

Task 5.1.1. Review and evaluate proposed research projects utilizing the criteria listed above. Contact ongoing or completed research that occurs on the KWA for copies of data and/or published papers.

Task 5.1.2. Consider whether there is a need to develop a special agreement (Memorandum of Understanding) with the University of California to streamline review of projects that involve the McLaughlin Reserve and the KWA.

Public Use Element 6: Environmental education and group activities.

Environmental education is a compatible public use of the KWA. Local organizations and special interest groups are already accessing the Wildlife Area for group hikes and

Public Use Goal 6.1. Support environmental education use of the KWA through staff assistance, interpretive materials and the provision of permits for group activities.

Task 5.1.1. Encourage all environmental education and natural resource interpretation (informal education) users to incorporate the Department's Natural Resource Education Messages guidelines in their field environmental education activities, curriculums, and interpretive programs, both on and off-site.

Public Use Goal 6.2 Provide additional appropriate natural resource interpretive opportunities if public demand reaches a significant level.

Task 6.2.1. Determine the feasibility of using local volunteers to conduct onsite interpretive events that increase the awareness and appreciation of the wildlife area.

Task 6.2.2. Develop interpretive and site orientation signage that reflects wildlife area management objectives for recreation and resource management

Task 6.2.3. If public usage reaches a significant level of demand, develop a more formal interpretive plan element in the management plan

Management Constraints on the Public Use Elements— The goals of the public use elements are constrained by a range of natural and human-induced factors. Effective management of the wildlife area requires that these factors be identified and considered. These factors include:

Environmental factors

- Compatibility of public uses with biological goals depends on the intensity of use and the number of users. Uses that have negligible impacts on biological goals at current levels may have negative impacts at higher levels. Uses that are currently considered compatible may have to be curtailed in the future if they cause degradation of vegetation, erosion, or declines in populations of sensitive species.

Legal, political, or social factors

- Public use has the potential to increase trespass onto adjoining property. Boundary signage will curtail but may not completely stop trespass onto private property.
- Different public uses have the potential to conflict with one another, especially if overall use of the KWA increases in the future. If conflicts develop, uses may need to be segregated in space and time or some uses may need to be restricted

Financial factors

- As with biological elements, limited funding for staff and operations is a major constraint on management for public use. This Plan proposes a higher level of public use management which will only be met with an increase in funding for staffing and materials for the KWA.

❖ **Facility Maintenance Elements: Goals and Management Constraints**

The effective management of the KWA will require that a regular facility maintenance program be established to meet the goals of the public use and biological elements. Existing facilities that are important to the management of the KWA include the historic system of ranch roads, barbed-wire fencing along Berryessa-Knoxville Road, three graded and graveled parking areas, stock ponds, and signage along Berryessa-Knoxville Road.

Facility Maintenance Element 1: Facilities to support and manage public use.

Facility Maintenance Goal 1.1. Secure the KWA from vehicular trespass. The fencing along Berryessa-Knoxville Road is the most important element for managing public use at the KWA. Uncontrolled vehicle traffic can result in erosion and damage to vegetation, particularly in riparian areas and seeps. The KWA must be gated, signed, and monitored to protect vegetation and wildlife habitat.

Task 1.1.1. Maintain existing fencing along Berryessa-Knoxville Road and install additional barriers as needed. New barriers to vehicle traffic should be designed to allow easy access by people on foot (e.g., barbless wire fencing, cable barriers, or boulders).

Task 1.1.2. Maintain signage along Berryessa-Knoxville Road and along the northern boundary of the KWA. Signs should identify the Wildlife Area and indicate that motorized vehicles are prohibited.

Task 1.1.3. Coordinate with the BLM to install barriers to control vehicular access at the northern boundary of the KWA.

Task 1.1.4. Coordinate with other law enforcement agencies (Napa County Sheriff's Department, BLM) to enforce the vehicular prohibition in the KWA.

Facility Maintenance Goal 1.2. Maintain the three existing parking areas.

Task 1.2.1. Keep parking areas graded and graveled.

Task 1.2.2. Monitor parking areas for introductions of invasive species and eradicate as necessary.

Task 1.2.3. Close parking areas as needed to prevent damage in the winter.

Facility Maintenance Goal 1.3. Maintain existing access routes through the KWA and improve access to the KWA.

Basic access improvements and "trail" maintenance is necessary to support public use of the Wildlife Area.

Task 1.3.1. Maintain the existing 19.7 miles of ranch road for administrative vehicle access and non-motorized public use (requires annual mowing, removal of downed trees and repair of washouts).

Facility Maintenance Goal 1.4. Maintain and improve signage to identify all accessible boundaries of the KWA, to inform the public of laws and regulations applicable to the KWA, and to provide interpretive and safety information.

Signs are the primary means by which the Department may inform users about the Wildlife Area. Currently signage is limited to two types of sign—those that identify the boundary of the Wildlife Area and those that state the prohibition on access by motor vehicles. Additional signage is necessary to provide information about Wildlife Area regulations, geography, safety, natural and cultural history, and management activities.

Task 1.4.1. At all three parking lots, install kiosks or bulletin boards with wildlife area maps and regulations, interpretive material, and safety information.

Task 1.4.2. Start a monitoring and maintenance schedule for all signage.

Task 1.4.3. Install boundary signs along the north boundary of the KWA (border with the BLM) and along the northwest boundary of the KWA (border with the McLaughlin Reserve).

Facility Maintenance Goal 1.5. Remove remnants of recent human activity (tanks, fences, etc), provided that such remnants have no historical or management value.

The KWA contains numerous "improvements" to facilitate ranching. These include barbed wire fencing to create 9 paddocks, corrals, tanks, storage sheds, and water troughs. The Department may wish to retain some of these improvements if cattle grazing is employed as a tool for management. However, cattle grazing for management, if it occurs, will be at a lower intensity than previous commercial grazing, and some improvements may not be needed. Removal of ranching improvements will

increase the wilderness value of the KWA. Also, removal of unnecessary fencing will facilitate public access.

Task 1.6.1. Review inventory of ranching improvements from 1993 property appraisal commissioned by Homestake Mining Company.

Task 1.6.2. Determine which improvements may have management or historic value.

Task 1.6.3. Remove improvements with no management or historic value, as needed.

Facility Maintenance Element 2: Facilities to support biological goals and resource management.

Facility Maintenance Goal 2.1. Maintain stock ponds and water delivery systems with value for management or wildlife habitat, repair or remove non-functional dams.

Stock ponds and water delivery systems originally designed for watering cattle can also provide or enhance habitat for some wildlife species. However without maintenance, stock ponds can cause erosion and sediment input into streams. Stock ponds can also serve as foci for the spread of invasive species such as bullfrogs, yellow starthistle, and bull thistle.

Task 2.1. Review stock pond inventory (Appendix B) and determine which ponds merit repair, ongoing maintenance, and weed management.

Task 2.2. Repair or remove dams that are breached and causing erosion. Follow up on dam removal with weed control and revegetation using native species.

Task 2.3. Review existing water delivery system. The Department may wish to repair and retain some components of the system to provide watering sources for wildlife (or cattle).

Task 2.4. Remove or bury in place visible sections of the water delivery system that are not needed or are beyond repair.

Facility Maintenance Element 3: Cultural resources.

The KWA contains significant cultural resources, some of which were documented by the Anthropological Studies Center of Sonoma State University (Haydu 2001, 2004). These resources include evidence of prehistoric occupation and land use, and the remains of historic homesteads and mines dating back to the mid nineteenth century.

Human activity on the KWA has been continuous since prehistoric occupation and many remnants of more recent human activity may not constitute significant cultural resources. Some remnants of human activity may need to be removed or disturbed because of safety hazards, aesthetic impacts, or conflicts with other management goals. Whenever an action with potential impacts on cultural resources is contemplated, Department staff will follow a standard procedure to evaluate the significance of the resource, and to determine whether the potential impact is acceptable or requires mitigation. The California Register of Historic Resources (CRHR) serves as a guide to cultural resources when there is a discretionary action subject to the California Environmental Quality Act, and also serves as a guide for management of the KWA. The CRHR lists criteria for evaluating the significance of cultural resources and their eligibility for listing in the Register (Haydu 2004). Adverse effects to cultural resources eligible for listing will be avoided or the effects mitigated.

Facility Maintenance Goal 3.1. Catalog and preserve all cultural resources that have yielded or have the potential to yield information important to the prehistory or history of the KWA or that otherwise meet significance criteria according to the CRHR.

Use Goal: To encourage anthropological research that makes use of significant cultural resources on the KWA.

Task 3.1.1. Survey the historic system of ranch roads for significant cultural resources. This historic system of ranch roads is singled out for survey effort because maintenance of the road has the potential to disturb cultural resources, including the roadbed itself, and because most public use within the KWA will be concentrated along this road. In 2003 the Anthropological Studies Center of Sonoma State University surveyed all roads that the Department currently maintains in Long Canyon and Foley Canyon. The study authors concluded that the ranch roads themselves do not constitute significant cultural resources.

Task 3.1.2. Preserve other cultural resources identified by Haydu (2001) and Haydu (2004). The Anthropological Studies Center identified several sites and artifacts that may be eligible to CRHR, or that are ineligible to CRHR, but are nevertheless an interesting feature of the cultural landscape (*i.e.*, the Foley Canyon windmill). The Department will avoid disturbing these sites.

Task 3.1.3. Conduct additional cultural resource surveys as necessary. Cultural resource surveys will precede all activities (e.g., weed management activities that involve ground disturbance) with the potential to disturb cultural resources.

Task 3.1.4. Conduct cultural resource surveys and encourage academic archaeological research in coordination with prescribed fire and immediately after natural fires. By removing herbaceous and shrubby vegetation, fire greatly increases the effectiveness of cultural resource surveys. To the extent possible, cultural resource surveys should be conducted immediately after fires have occurred.

Management Constraints on Facilities Maintenance Elements—The goals of the facilities maintenance elements are constrained by a range of natural and human-induced factors. Effective management of the wildlife area requires that these factors be identified and considered. These factors are:

Environmental factors

- Maintenance requirements will depend largely on the severity of winter weather conditions. In years of exceptional rainfall, flooding or erosion may damage roads, fences, and signage, and the degree of damage will dictate maintenance priorities.

Legal, political, or social factors

- The addition of signing, access improvements, and portable sanitation will result in public expectation for the maintenance of these improvements. Some of these improvements may attract vandalism. The frequency and severity of vandalism may impact the Department's ability to maintain the improvements or to continue to provide them over the long term.

Financial factors

- As with other elements, limited funding for staff and operations is a major constraint on facilities maintenance. Full realization of the facilities maintenance goals will require an increase in funding for the wildlife area.

❖ **Management Coordination Element: Goals and Management Constraints.**

Many of the biological, public use, and facility maintenance elements and goals require coordination with other public agencies or private landowners. This section describes specific actions that the Department can take to facilitate such coordination. The BRBNA Conservation Partnership should serve as the focal point for management coordination, because all of the agencies managing public lands in the vicinity of the KWA as well as many private landowners and interest groups are active participants in the partnership.

Management Coordination Goal 1: Participate in ongoing management coordination with the Blue Ridge Berryessa Natural Area Conservation Partnership.

Task 1.1. Maintain active participation in the BRBNA Conservation Partnership by having at least one Department representative attend each (approximately) monthly meeting.

Task 1.2. Consider the feasibility of assigning a Department representative to serve on the BRBNA Stewardship Committee.

Management Coordination Goal 2: Coordinate signage with managers of adjacent public lands and owners of adjacent private lands.

Several facilities maintenance goals call for improving signage around the boundaries of the KWA. In most cases this will be most efficient if signage is coordinated to indicate transitions between different land management agencies or to private property.

Task 2.1. Maintain contact with managers of adjacent public lands and owners of adjacent private lands. Discuss mutual signage needs and share labor and materials when possible.

Management Coordination Goal 3: Coordinate with other law enforcement agencies.

Law enforcements needs and jurisdictions at and around the KWA overlap with the Napa County Sheriff's Department, the BLM, and the California Highway Patrol. Law enforcement along the highway is primarily accomplished by the Sheriffs Office and the California Highway Patrol. Enforcement away from the highway by DFG Wardens is restricted due to the limited staffing and difficult access and provides only an occasional presence. Greater effectiveness in enforcing laws and regulations at the KWA could be achieved by coordination with the other law enforcement entities. In particular, the Napa County Sheriff's Department has recently formed an off-highway team, which focuses its effort on the BLM Knoxville Recreation Area immediately adjacent to the KWA.

Task 3.1. Open a dialog with the Napa County Sheriff's Department to explore the possibility of coordinating law enforcement services at the KWA.

Task 3.2. Meet regularly with law enforcement staff from Napa County, BLM, and other agencies as appropriate to coordinate law enforcement activities and explore options for cooperative programs.

Task 3.3. Explore the possibility of providing additional training to Napa County Sheriff's Deputies for enforcement of resource law and regulations specific to the KWA.

Task 3.4. Explore the possibility of providing Napa County Sheriff's Deputies vehicular access to the KWA.

Management Coordination Goal 4: Coordinate with local public service agencies.

Several public service agencies, including the Napa County Road Department and the California Department of Forestry and Fire Protection (CDF) provide service in and around the KWA. The Napa County Road Department maintains Berryessa-Knoxville

Road, which is the primary access to the KWA and the CDF is the primary agency responsible for fire protection services in the KWA and surrounding private and public lands. Coordination with these agencies is necessary to ensure that their activities are consistent with the goals of this Plan.

Task 4.1. Work with CDF to develop a fire response plan consistent with the goals of this plan and the protection of private property and public safety.

Currently there is little evidence that fire frequency is abnormally high at the KWA, so in the short term the biological goals of this plan may be best met by taking a less than fully aggressive approach to fighting wildfires in the KWA. For example, the negative impacts of using bulldozers to cut fire lines (i.e., erosion and spread of invasive species) may outweigh and benefits of containing a fire more quickly as long as there is no threat to private property and public safety. In any case, existing fire breaks should be relied upon as much as possible and a fire response plan should identify the most appropriate areas to cut fire lines if necessary, and should identify sensitive areas where use of mechanized equipment should be avoided altogether.

Task 4.2. Communicate regularly with the Napa County Road Department to ensure that road maintenance activities are consistent with the goals of this plan.

In particular, work with the Road Department to ensure that maintenance of and improvements to Berryessa-Knoxville Road minimize the potential for erosion, and maximize natural flow dynamics in Knoxville and Eticuera Creeks.

Management Coordination Goal 5: Share resources and equipment with other public land management agencies.

Several public entities have needs for heavy mechanized equipment in the vicinity of the KWA. The University of California, BLM, and County of Napa all have needs for equipment to maintain roads, install fences and barriers to vehicle traffic, and to control invasive species. There may be an opportunity to improve the efficiency of maintenance for the Department and for the State of California as a whole by sharing equipment and resources. Currently the Department has an agreement with the University of California for a coordinated program of tamarisk eradication on the McLaughlin Reserve and the KWA. This can serve as a model for such coordination.

Task 5.1. Evaluate the potential to include various public entities in agreements for sharing of existing equipment and resources.

Task 5.2. Work with other public entities to apply for grant funding for cooperative management activities.

Management Coordination Goal 6: Formalize an agreement for use of the barn on the McLaughlin Reserve.

Currently the Department has an informal agreement with Homestake Mining Company and the University of California to store vehicles and equipment in a barn on the McLaughlin Reserve. This agreement should be formalized to clarify issues of responsibility for maintenance and liability for damage.

Task 6.1. Draft an MOU with the University of California to formalize the Department's use of a barn on the McLaughlin Reserve.

Management Constraints on the Management Coordination Element—The goals of the facilities maintenance elements are constrained by a range of human-induced factors. Effective management of the wildlife area requires that these factors be identified and considered. Important constraints that impact the management coordination element include:

Legal, political, or social factors

- The public and private entities that manage property in the Knoxville and Eticuera Creek watersheds have different missions, objectives, and procedures that must be considered and accommodated. These differences may constrain the degree of cooperation possible.

Financial factors

- Management coordination is intended to increase the efficiency of attaining the goals of this plan. Nevertheless, coordination will require initial and ongoing investment of staff time, the availability of which will depend on funding.

VII. OPERATIONS AND MAINTENANCE

The implementation of the Plan will require additional staffing and resources to accomplish the Tasks that are established in Chapter VI. The Knoxville Wildlife Area is not currently assigned specific staff time or budget. This Plan proposes proactive ecosystem management of the Knoxville Creek and Eticuera Creek watersheds at a level that is more intensive than in the past. The will require a commitment of additional budgetary resources if the goals of the Plan are to be achieved.

In addition to financial resources, this Plan will need to be kept current and revised as necessary to respond to changing situations. It is expected that ongoing adaptive management of the KWA and advancement of scientific knowledge regarding invasive species control and restoration of native vegetation will result in new techniques and opportunities for more effective management of the KWA. Procedures to help keep this Plan current and relevant are included in this Chapter.

❖ Existing Staff and Additional Personnel Needs

Currently no Department staff positions are specifically budgeted to the KWA. Existing staff positions do, however, provide services to the Wildlife Area including the following:

- Approximately 5% of an Associate Wildlife Biologist's time
- Approximately 25% of a Habitat Supervisor's time
- Approximately 30% of a Tractor Operator/Laborer's time.

Currently, staff time of the Associate Biologist has been spent on overseeing the contract for this Plan and participating in meetings of the BRBNA Conservation Partnership. The Habitat Supervisor and Laborer's time have been spent on the tamarisk removal efforts.

To adequately support the Wildlife Area and to perform the tasks identified in this Plan, a combination of program management, site management, maintenance and warden staffing is required. The staffing program proposed in this Plan incorporates permanent staffing supplemented by seasonal labor.

Program Management—Associate Wildlife Biologist position (0.25 PY)

This individual will serve as the manager of the Wildlife Area, perform technical tasks and give direction to maintenance staff. The individual will serve as the Department's principal representative to the BRBNA Conservation Partnership and in coordinating management with other private and public entities. This person will have principal responsibility for implementation of this Plan.

Site Management—Habitat Supervisor I position (0.5 PY)

Day to day field operations will require a Habitat Supervisor I position. The individual will act as the field manager for the Wildlife Area, performing the basic communications, monitoring, and support functions. The individual will assist and direct regular Department staff, seasonal labor and volunteers performing maintenance tasks as directed by this Plan.

Ongoing maintenance—Tractor Operator/Laborer position (0.5 PY) and additional seasonal staff (Scientific Aid) positions (1 PY).

Under the direction of the Habitat Supervisor I, one skilled position will be required to operate machinery and perform maintenance tasks related to signing, access improvements, control of invasive species, restoration, and other habitat improvement projects. Additional seasonal laborer time (equivalent to 1.0 PY) will be required to implement weed management programs during appropriate times of year (primarily spring and summer).

Law Enforcement—Fish and Game Warden (0.25 PY)

The periodic presence of a Fish and Game Warden will be required to patrol the Wildlife Area to protect natural resources, especially during the high use periods (turkey and deer seasons). The individual will deal with fish and game violations and enforce other Wildlife Area regulations including those related to vehicular use and vandalism. The individual will also assist adjacent landowners with concerns regarding trespass and vandalism.

❖ Operations and Maintenance Cost

The proposed staffing and annual operations and maintenance budget has been summarized here in order to establish an annual estimated cost for the operation of the Wildlife Area.

Staffing

The annual cost of the proposed staffing program is as follows:

Position	PY's	Yearly Salary ¹	Adj. %
Associate Wildlife Biologist	0.25	\$ 62,604	\$ 15,651
Wildlife Habitat Supervisor I	0.5	48,876	24,438
Tractor Operator/Laborer/ Range B	0.5	60,084	30,042
Fish and Game Warden, Range B	0.25	53,184	13,296
Fish and Wildlife Technician/ Range B	1	39,312	39,312
Total Staffing	2.5		\$ 122,739

¹all salaries shown at maximum rates and state employee benefits are not included. Wardens receive additional compensation not shown in this chart.

Materials, supplies and capital equipment

A materials and supplies budget will be required to provide office supplies, materials, fuel, and small tools, etc. to support management and maintenance activities. Cost considerations will include replacement signs, fences and other barriers, herbicide, gravel, etc. The Department currently has the tractor and road grading equipment it needs to maintain dirt roads and continue a very limited amount vegetation management at its Regional office/yard in Napa County. To undertake the tasks proposed here, additional equipment such as mowers, vehicles, all-terrain vehicles, spray units, or tractors may be needed. Based on past expenditures and comparisons with other wildlife area maintenance operations, an annual budget requirement of \$80,000 is proposed.

The total annual cost (salary, materials and supplies, and additional capital equipment) is estimated to be approximately \$202,739 in 2004 dollars.

❖ Future Revisions to this Plan

All planning documents eventually become dated and require revision so they can continue to provide practical direction for operational activities. A common and unfortunate situation is that the revision of planning documents is often neglected because the process for revision is considered too involved and too cumbersome. To address this problem, this Chapter incorporates a hierarchy of revision procedures in which the level of process and required involvement is proportionate to the level of change that is proposed. This Plan reflects the best information available during the planning process, but it is understood that new information will become available over time and there will be the need to make adjustments to keep this Plan current. Such new information may include any of the following:

- Feedback generated by monitoring results of management activities (adaptive management).
- Other scientific research that directs improved techniques of management.
- Documented threats to biotic communities, habitats, or wildlife species.
- New legislative or policy direction.

When the new information dictates a change to this Plan, it is important that there is an appropriate process established. Public outreach and public input will be necessary in proportion to the proposed change to the policy established by this Plan. Unless a clear revision process exists, this Plan, like plans in many organizations will become outdated and irrelevant.

Minor Revisions—A process is required to accommodate minor revisions to this Plan that may include the addition of new property to the Wildlife Area or the adoption of limited changes to the goals and tasks as a result of adaptive management, other

scientific information, or legislative direction. This procedure will be applicable to revisions that meet the following criteria:

- No change is proposed to the overall Purposes of this Plan
- CEQA documentation (if required) is prepared and approved.
- Appropriate consultation within the Region and with the Lands and Facilities Branch occurs.
- Appropriate consultation with other agencies occurs.
- Adjoining neighbors are consulted regarding the revision, if the revision is related to a specific location or the acquisition of additional area.
- An information presentation regarding the proposed revision is made to the BRBNA Conservation Partnership.

The Minor Revision may be prepared by the staff assigned to the Wildlife Area or with other Department resources and requires approval by the Regional Manager.

Major Revision or a New Comprehensive Management Plan—New policy direction or a new comprehensive management plan requires a procedure comparable to the planning process, but also proportionate to the level of policy change that is proposed. This procedure will be applicable to revisions that meet the following criteria:

- Substantial revision is proposed to this Plan or the adoption of a complete new plan is proposed.
- Appropriate CEQA documentation is prepared and approved.
- Appropriate consultation within the Region and the Department's Lands and Facilities Branch occurs.
- Appropriate coordination and consultation with other agencies occurs.
- A public outreach program is conducted proportionate to the level of the proposed revision.
- An information presentation regarding the proposed revision or plan is made to the BRBNA.

The major revision or new plan may be prepared using available Department resources. The major revision or new plan requires recommendation by the Regional Manager and approval by the Director of the Department.

If the appropriate procedure for a particular proposed revision is not apparent, the determination of which of these procedures to use shall be made by the Regional Manager in consultation with the Lands and Facilities Branch.

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Appendix A.

Public Outreach Summary

Table A.1. Ranking of oral comments provided at the first public input meeting, August 6, 2003, Napa Public Library

Comment	"Votes"
1. Guarantee hunting into the future	56
2. Prohibit motor vehicles [allow foot and horseback only (36), allow foot, horseback, and bicycles (1)]	37
3. Prohibit grazing (21) or use grazing only as a tool for wildlife habitat management or for restoring native plants (6)	27
4. Develop and maintain hiking/equestrian trails as part of a regional trail system on public lands (several specific proposals were made)	21
5. Allow limited-duration back-country camping	14
6. Consider state wilderness designation	13
7. Control invasive weeds and restore native grasses, oaks, and other plants (possibly through the use of prescribed fire)	12
8. Manage for Tule Elk reintroduction	10
9. Provide for limited motor vehicle access at Knoxville Wildlife Area	9
9. Improve signage and provide interpretive displays and brochures (4), including some promoting fire-prevention awareness (5)	9
10. Build and maintain ponds and water sources for wildlife	8
10. Prohibit shooting except for hunting (i.e., no target shooting or plinking)	8
11. Consider a portion of the areas for junior or limited-opportunity hunts (e.g., junior turkey hunts)	5
11. Prohibit commercial activity	5
11. Prohibit hunting	5
11. Schedule non-overlapping periods for hunting and non-hunting activities	5
12. Adopt a regional management perspective (e.g., consider that recreational opportunities already existing on nearby public lands [e.g., target shooting] need not be also provided by DFG, or that some activities [hiking and backpacking] may require consistent regulations across management units)	4
13. Allow target shooting in designated areas	3
14. Provide a roadside emergency phone or cell phone service	2
14. Establish a monitoring program for human impacts	2
14. Restrict bicycles to motor vehicle routes	2
15. Provide more access points through fences	1
15. Develop a policy for as yet unknown demands for future use	1
15. Provide designating parking areas	1
15. Coordinate law enforcement with other agencies (share staff)	1
15. Ensure management plan protects the rights of private landowners	1
15. If additional roads are provided, restrict access to street-legal vehicles	1

Table A.2. Ranking of oral comments provided at the second public input meeting, October 30, 2003, Woodland Public Library.

Comment	"Votes"
1. Consider the impact of wildlife area management on surrounding private lands	18
2. Manage Knoxville as a State Wilderness Area	16
3. Guarantee hunting into the future	9
4. Consider linking Knoxville to the Blue Ridge Trail	6
5. Assess whether any existing roads can be used for vehicular access	5
5. Encourage youth hunting opportunities	5
6. Develop a fire prevention/response plan (especially addressing campfires and protection of natural values)	4
6. Integrate these wildlife areas into a regional trail system	4
7. Prohibit livestock grazing	3
7. Provide more foot access entry points for the public (i.e., gaps in fences)	3
7. Make Knoxville a type B wildlife area	3
8. Keep invasive plants out and keep working to eradicate existing invasive plants (especially yellow starthistle) and promote native bunch grasses	2
8. Place low emphasis on prescribed burns and high emphasis on elk for vegetation management	2
8. Improve signage to prevent trespass onto private land	2
8. Do not allow reseeding (especially with exotic species) after fire	2
8. Provide interpretive signage with an emphasis on "leave no trace" ethics and also providing general information on the area	2
8. Prohibit wind generation facilities at Knoxville	2
9. Route trails away from sensitive plant and wildlife areas	1
9. Define parking areas	1
9. If horses are allowed, add horse pass-throughs in fences	1
9. Allow remote camping	1
9. Do a recreation assessment of the area to decide what to do with old roads (keep them as trails or remove them). They need attention either way to prevent erosion.	1
9. Allow only non-mechanized access and management techniques	1
9. Use fire as a weed management tool	1
9. Develop a management plan for stock ponds to assess each pond's long-term viability, value for wildlife, and to prevent erosion. Consider habitat improvements around ponds (especially for elk).	1
9. Remove old barbed-wire fences from the interior of Knoxville	1
9. Keep Knoxville as a Type C wildlife area	1

Table A.3. Summary of written comments for the Knoxville Wildlife Area.

Comment	Times mentioned
1. Prohibit motor vehicles	15
2. Consider state wilderness designation	12
3. Develop trails in general (2), or as part of a regional trail system on public lands (some specific proposals were made) (7)	9
4. Allow for access by foot travel only (1), for foot and horseback only (3), for foot, horseback, and bicycles (bikes at least in areas where won't be detrimental to land) (2), and for trails that can accommodate deer-carts and bikes (1)	7
5. Guarantee hunting into the future (3) especially for turkeys (1)	4
6. Provide designating parking areas (3) but as numerous small pullouts instead of a few large parking lots (1)	4
7. Manage for multiple uses (3) with zoning if necessary (1)	4
8. Allow camping (2) but keeping sites 4-6 miles apart (1)	3
9. Provide adequate enforcement of regulations	3
10. No roads	2
11. Provide for limited motor vehicle access away from the main road for seniors and handicapped	2
12. Prohibit hunting	2
13. Keep land as natural as possible (1) and manage to enhance or restore values of the habitat/resources (1)	2
14. Improve signage in general (1) and to provide interpretive displays on fire-prevention awareness (1)	2
15. Protect the area from fire by constructing firebreaks (1) and banning summer/fall fires (1)	2
16. If grazing is allowed, use it as a tool for restoring native plants (1) or for fire management (1)	2
17. If roads are provided, keep them well maintained	2
18. Toilets are needed in all designated parking and hiking areas	1
19. Consider a land swap: KWA gets some land from adjacent BLM, and DFG's Cedar Roughs parcel goes to BLM	1
20. Build /maintain ponds and water sources for wildlife and people	1
21. Restrict vehicular traffic to DFG management/enforcement personnel	1
22. No shooting	1
23. If recreational shooting is allowed, restrict it to a small area	1
24. No Camping; day-use only	1
25. Restrict non-hunting uses to minimize potential accidents and to decrease the risk that pressure from non-hunter-users will some day result in KWA being closed to hunting	1
26. Fence in all protected areas	1
27. Prevent erosion by preventing fire and overgrazing	1

Appendix B.

Methods and Results for Biological Surveys

❖ Surveys for Non-native Invasive Species

Invasive plant surveys concentrated on two vegetation types, grasslands and riparian areas, and targeted non-native species that have been recognized as transformers (i.e., those with (1) abundances that become disproportionately high compared to native species, that (2) transform natural processes and cycles, such as fire frequency, hydrology, decomposition, and that (3) greatly reduce or eliminate native species) and for which some measure of control is feasible. Different methods of surveying and recording were used for each vegetation type.

Grassland Survey Methods and Results

Survey units were defined by the polygons classified as California Annual Grassland or Serpentine Grassland on the Napa County MCV Vegetation Map.

Each grassland polygon was visited by a surveyor (Paul Aigner or Cathy Koehler) who estimated the percent cover of all target species (Table B.1). Most grassland polygons within the KWA were visited except for some small and isolated polygons at the south end of the Wildlife Area. Percent cover was estimated using eight categories (absent, <1%, 1-5%, >5-25%, >25-50%, >50-75%, >75-95%, and >95%). In polygons where target species were not homogenously distributed, the surveyor subdivided polygons into smaller more homogenous units, by drawing on paper maps in the field. These subdivided polygons and percent cover estimates were later entered into ArcMap. Surveys were conducted throughout the year, because most weeds could be identified by both fresh and dried growth.

Table B.1: Target species for grassland surveys.

Common name	Scientific name	Map
Non-native species		
Black mustard	<i>Brassica nigra</i>	B.1
Bull thistle	<i>Cirsium vulgare</i>	B.2
Goat grass	<i>Aegilops triuncialis</i>	Not found
Harding grass	<i>Phalaris aquatica</i>	B.3
Italian thistle	<i>Carduus pycnocephalus</i>	B.4
Medusa head*	<i>Taeniatherum caput-medusae</i>	B.5
Perennial pepperweed	<i>Lepidium latifolium</i>	B.6
Teasel	<i>Dipsacus sylvestris</i>	Not found
Yellow starthistle	<i>Centaurea solstitialis</i>	B.7
Native species		
Needle grass	<i>Nasella spp.</i>	B.8

* Cover estimated in a subset of survey units.

Because grasslands were heavily dominated by non-native annual grasses (in particular oat grass (*Avena fatua* and *Avena barbata*), soft chess (*Bromus hordeaceus*), rip-gut brome (*Bromus diandrus*), medusa head (*Taeniatherum caput-medusae*) and wild rye (*Lolium multiflorum*)) and these grasses were largely ubiquitous throughout the KWA, presence and cover of the species was not estimated (except that the cover of medusa head was estimated in a subset of survey units). In addition to target weeds, surveyors also estimated cover of the native bunchgrass (*Nasella* spp.).

Figure B.1. Distribution of black mustard (*Brassica nigra*) at the Knoxville Wildlife Area (2003-2004).

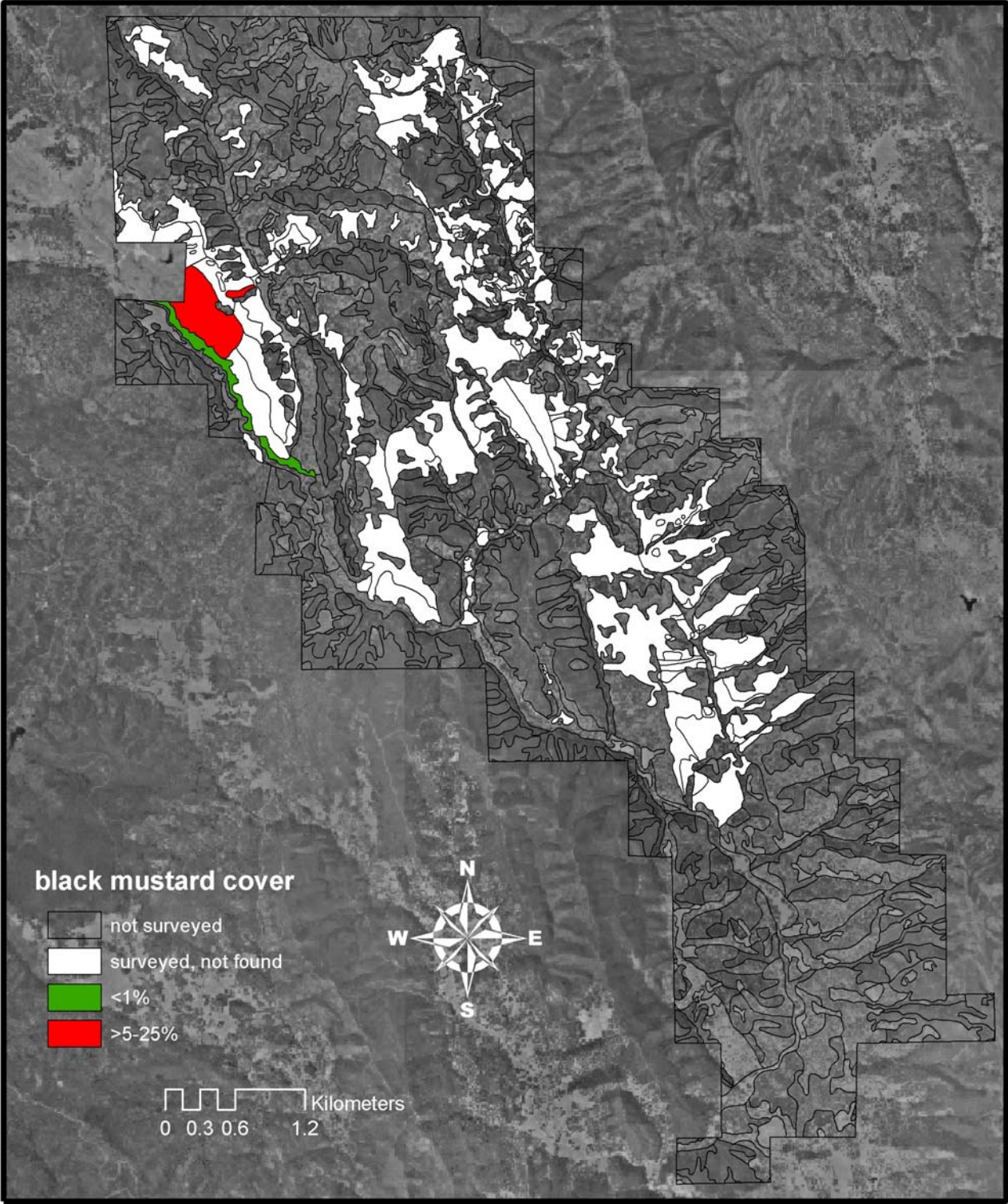


Figure B.2. Distribution of bull thistle (*Cirsium vulgare*) at the Knoxville Wildlife Area (2003-2004).

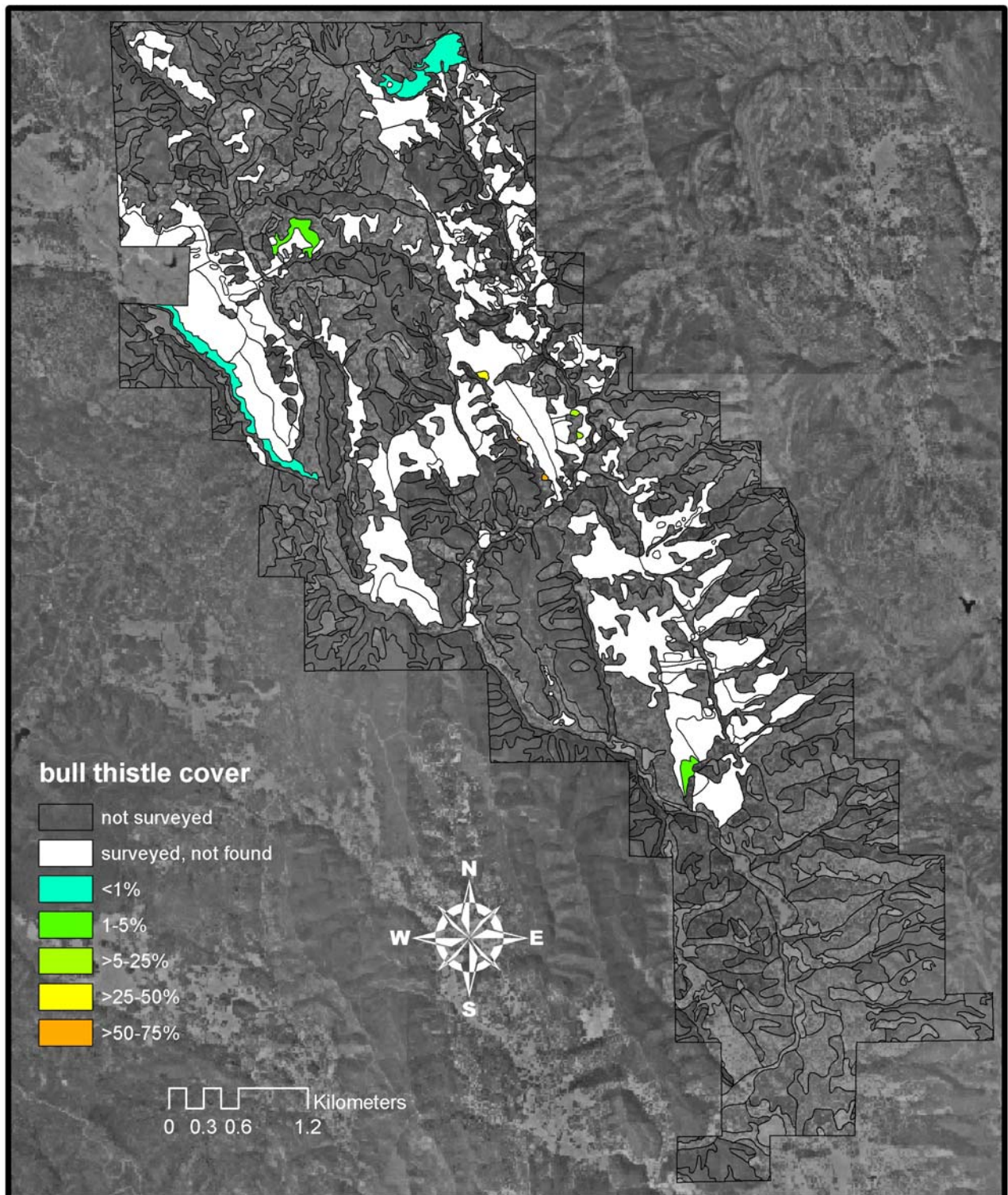


Figure B.3. Distribution of Harding grass (*Phalaris aquatica*) at the Knoxville Wildlife Area (2003-2004).

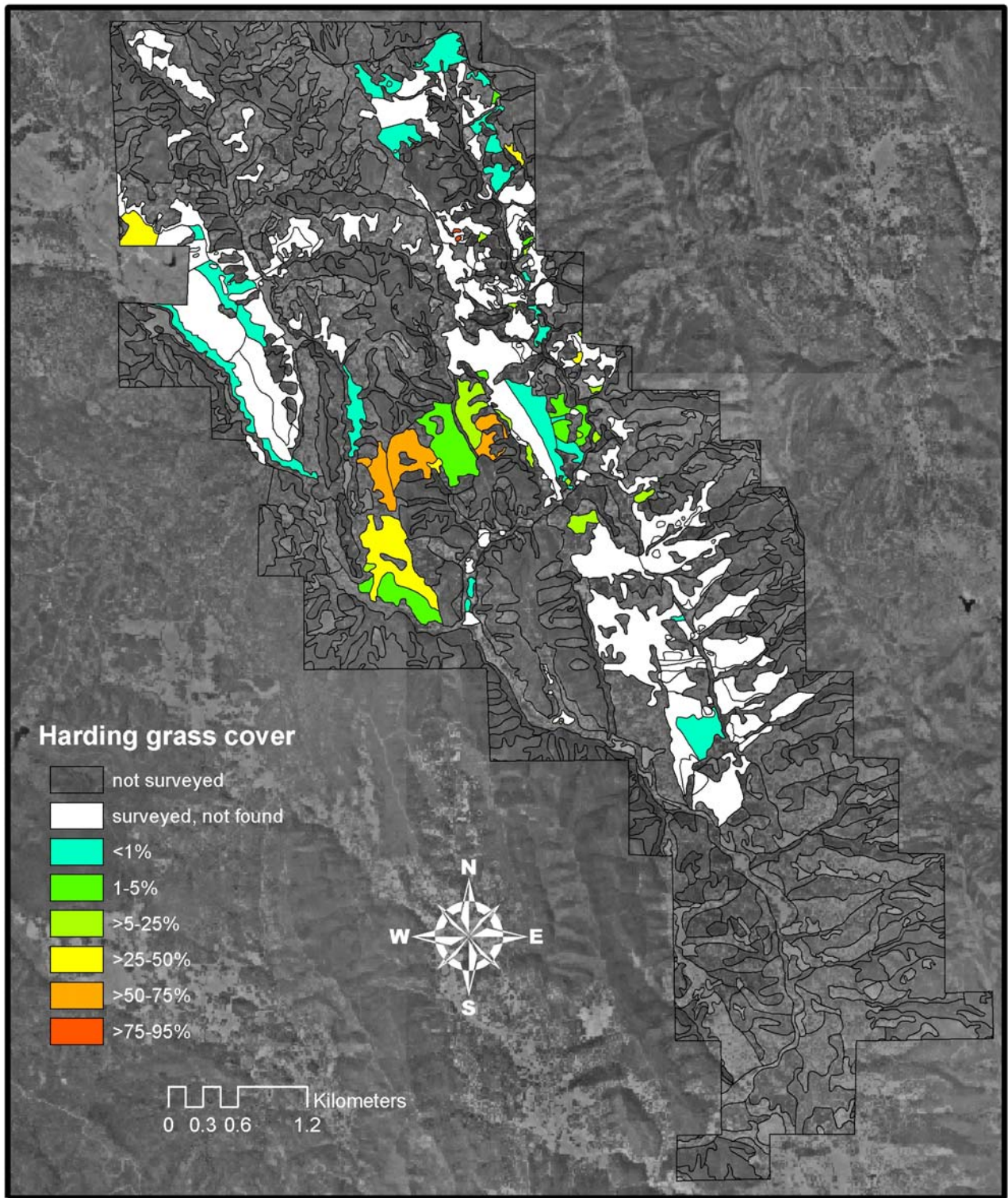


Figure B.4. Distribution of Italian thistle (*Carduus pycnocephalus*) at the Knoxville Wildlife Area (2003-2004).

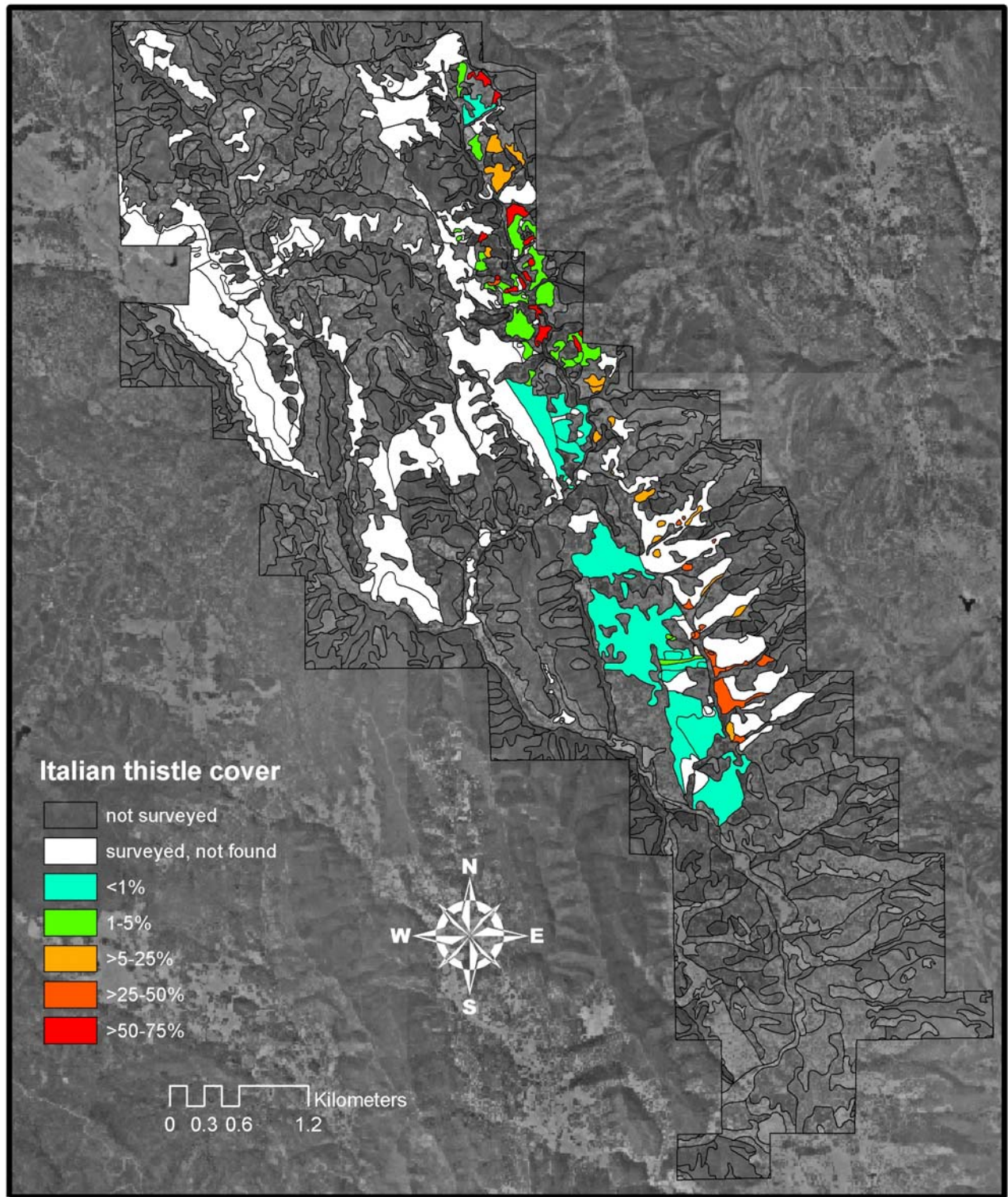


Figure B.5. Distribution of medusa head (*Taeniatherum caput-medusae*) at the Knoxville Wildlife Area (2003-2004).

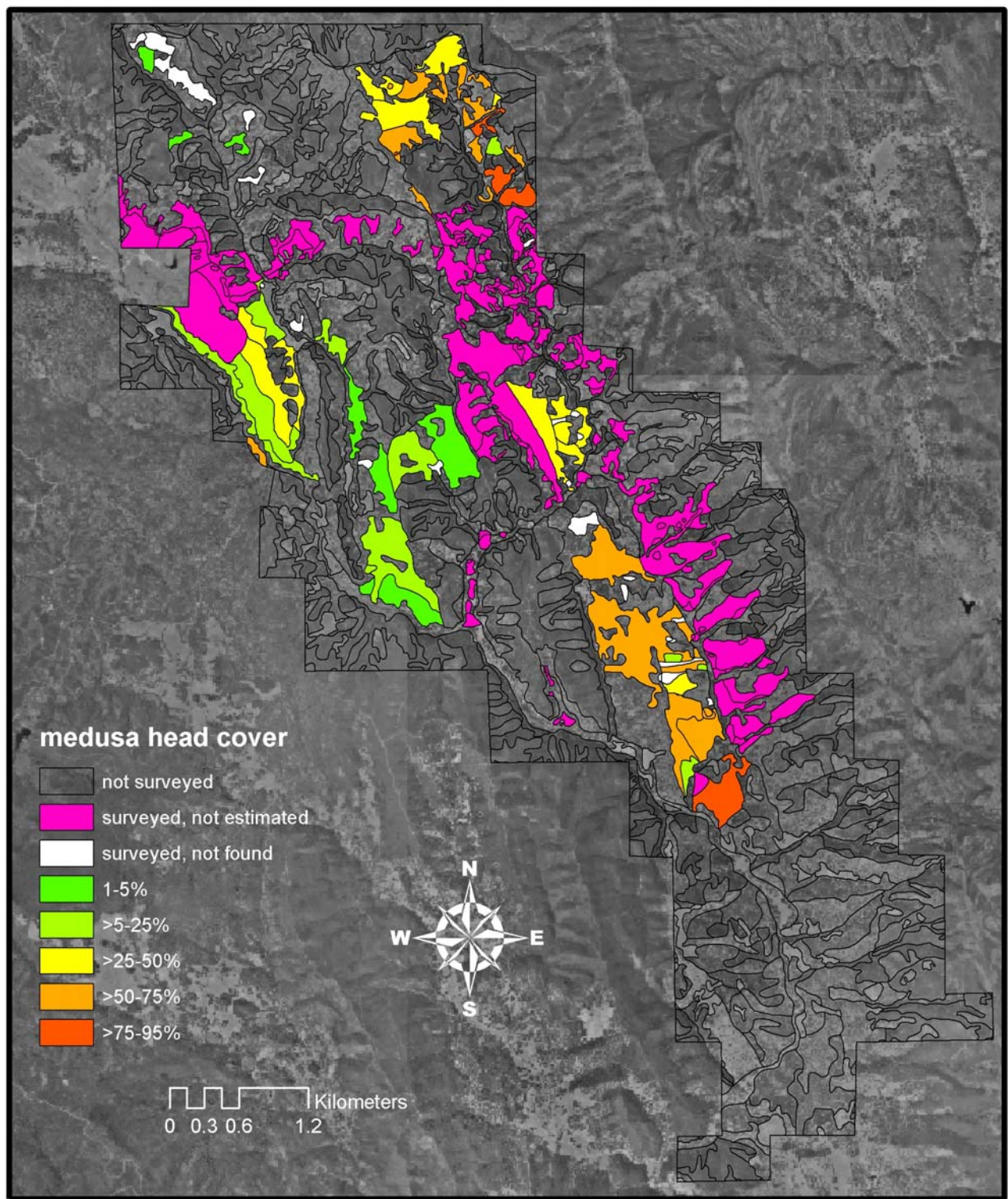


Figure B.6. Cover of perennial pepperweed (*Lepidium latifolium*) at the Knoxville Wildlife Area (2003-2004).

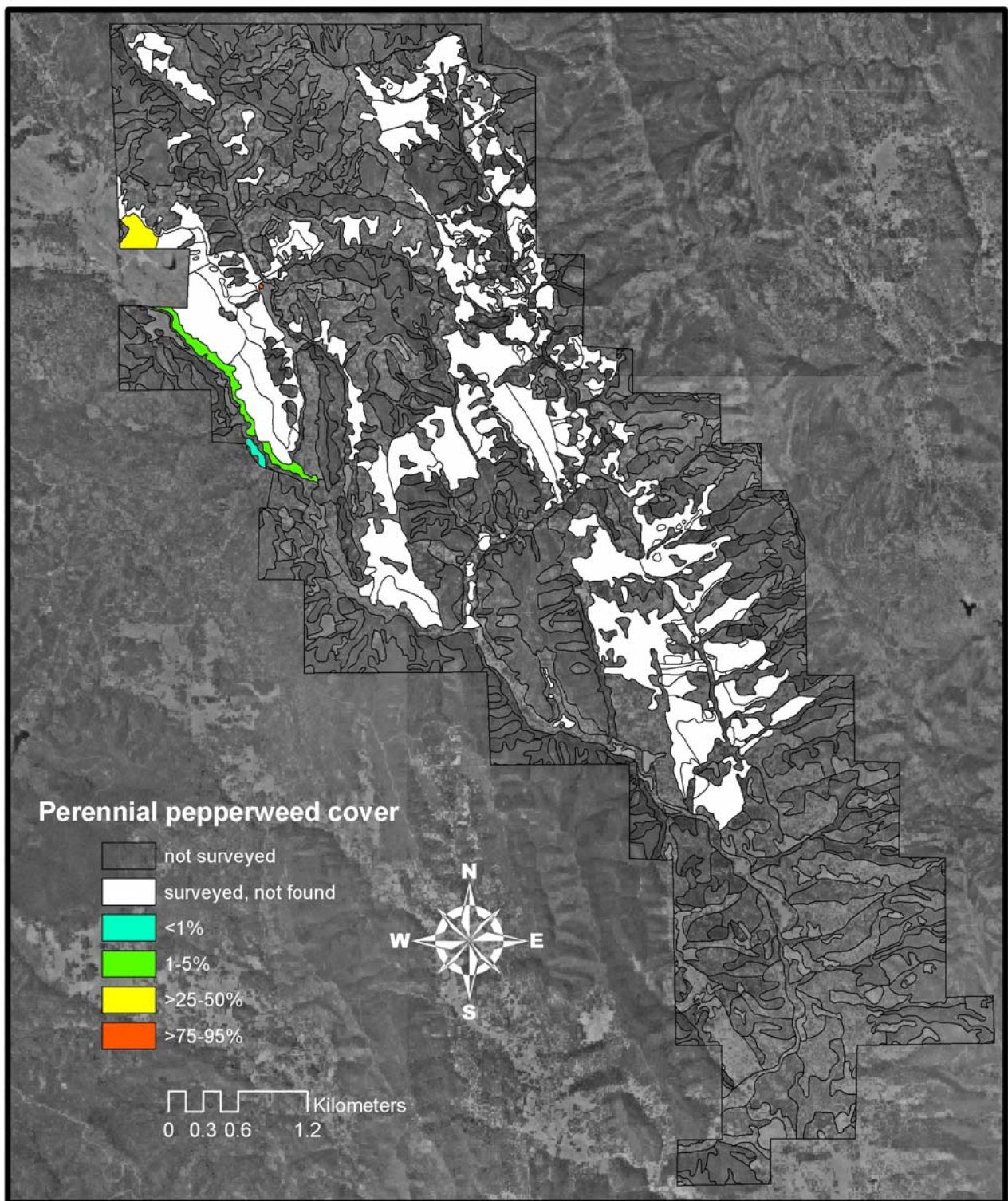


Figure B.7. Cover of yellow star thistle (*Centaurea solstitialis*) at the Knoxville Wildlife Area (2003-2004).

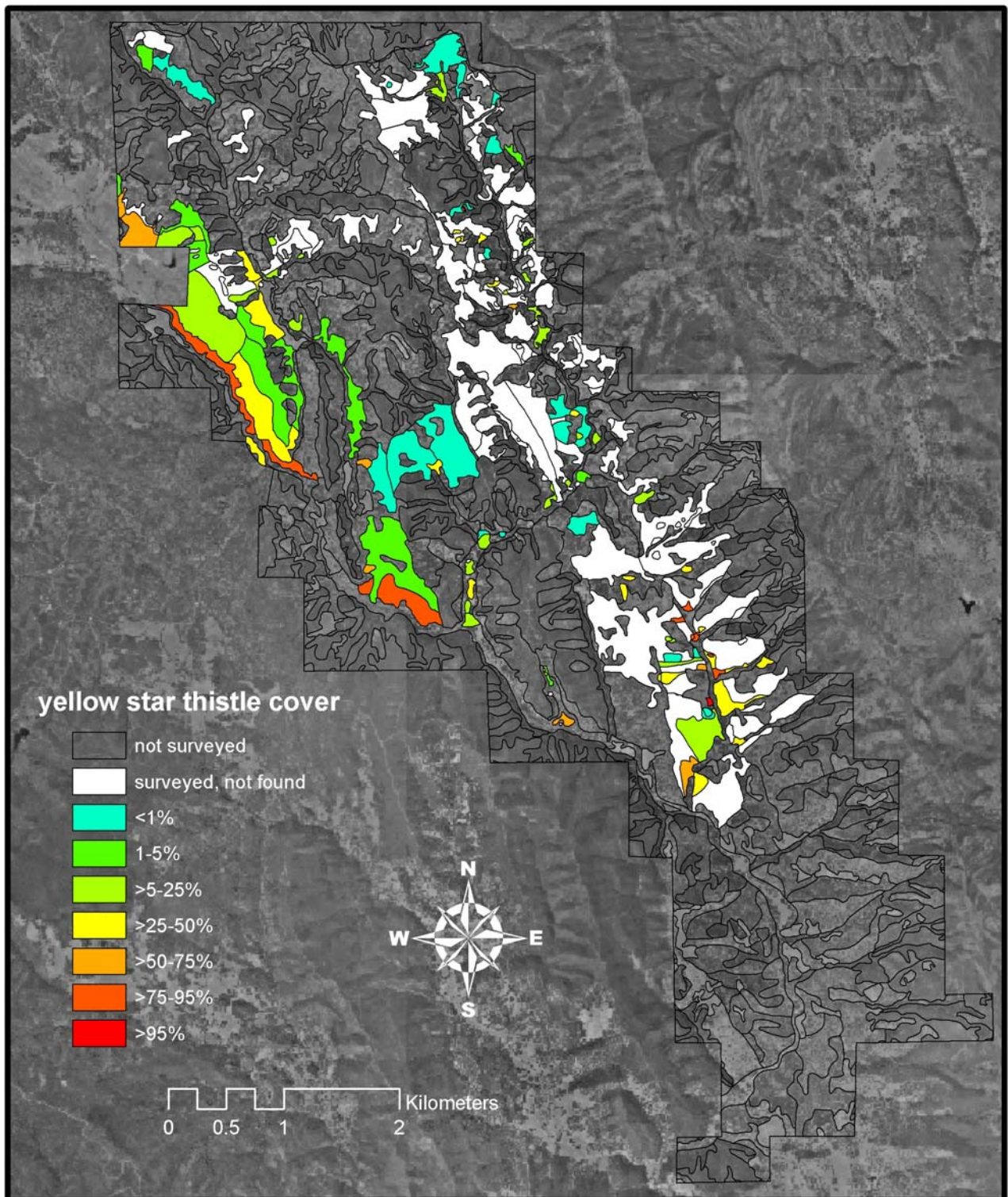
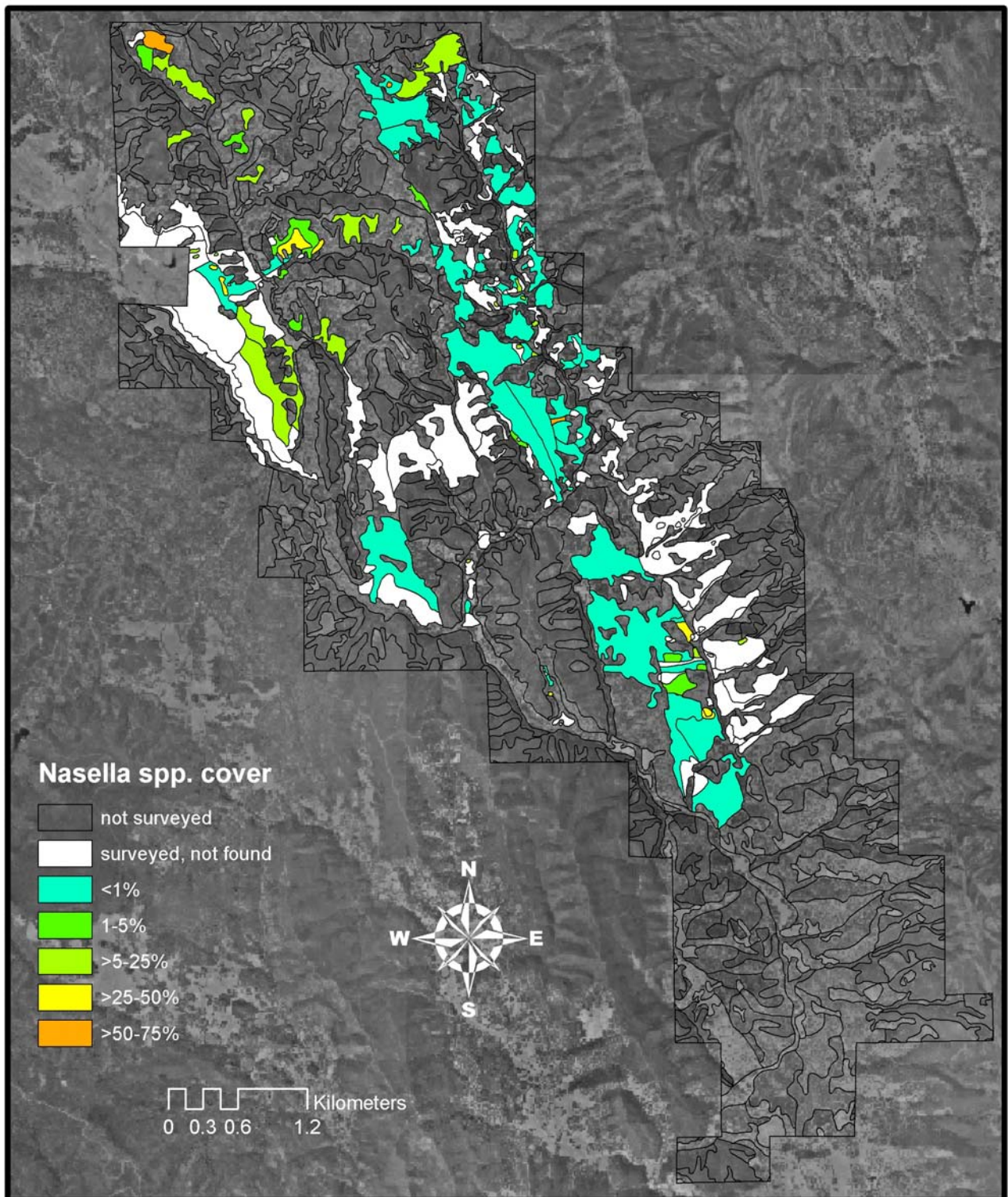


Figure B.8. Cover of needle grass (*Nasella* spp.) at the Knoxville Wildlife Area (2003-2004).



Riparian Survey Methods

Two riparian surveys were conducted by Jake Rugyt. The purpose of these surveys was to characterize the riparian vegetation (including native species) and to determine the distribution of non-native invasive species. The first survey was conducted on June 21, 2003. During this survey, three reaches of Knoxville/Eticuera Creek were visited and qualitatively characterized in terms of the abundance of native and non-native species (Figure B.9). A second survey was conducted between June 19 and September 4, 2004. This survey focused on Eticuera creek, starting in Long Canyon and continuing to about x kilometers north of the southern boundary of the KWA (Figure B.9, B.10[A-C]). During this survey noteworthy native and non-native species were recorded with a GPS unit.

Riparian Survey Results—Survey of June 21, 2003

Segment 1: Knoxville Creek - corral to homesite (Figure B.9).

This drainage is strongly influenced by serpentinitic soils and substrate particularly during the dry season when flow is maintained by a number of springs emanating from the serpentine bedrock. These conditions plays an important part in the current infestation of this stream by *Tamarix parviflora* and *Lepidium latifolium*, two species that tolerate alkaline waters. Species observed are listed in Table B.2.

Table B.2. Species observed along riparian survey segment 1 (Knoxville Creek). Asterisks following species names indicate non-native species.

Growth form	Species	Abundance
Tree	<i>Pinus sabiniana</i>	One individual on bench.
Tree	<i>Aesculus californica</i>	8 individuals clustered or widely scattered.
Tree	<i>Populus fremontii</i>	Recently planted in channel.
Shrub	<i>Salix breweri</i>	3 individuals in channel
Shrub	<i>Tamarix parviflora</i> *	Several resprouting from rootstock.
Shrub	<i>Rhamnus tomentella tom.</i>	5 Individuals scattered.
Shrub	<i>Sambucus mexicana</i>	One individual on bank.
Perennial	<i>Scirpus americanus</i>	Common in channel in broken stand.
Perennial	<i>Juncus mexicanus</i>	Patchy in channel
Perennial	<i>Lotus corniculatus</i> *	Intermittent dense patches along channel.
Perennial	<i>Stachys albens</i>	Scattered along entire reach.
Perennial	<i>Artemisia douglasiana</i>	Patchy along floodplain.
Perennial	<i>Leymus triticoides</i>	Patchy on floodplain.
Perennial	<i>Lepidium latifolium</i> *	Patchy along channel and follows some small tributaries into the hills to the east.
Perennial	<i>Hordeum brachyantherum calif.</i>	Uncommon on floodplain.
Perennial	<i>Piptantherum miliaceum</i> *	Scattered along banks.

Perennial	<i>Elymus glaucus</i>	Localized on banks.
Perennial	<i>Phalaris aquatica</i> *	Scattered on floodplain.
Perennial	<i>Asclepias fascicularis</i>	Uncommon on floodplain.
Perennial	<i>Typha domingensis</i>	Few patches in channel.
Perennial	<i>Heliotropium curassavicum</i>	Scattered along channel.
Annual	<i>Helianthus bolanderi</i>	Local along channel.
Annual	<i>Centaurea solstitialis</i> *	Broken stands on floodplain.

Segment 2: Knoxville Creek - near the mouth of Foley Creek (Figure B.9).

This reach of the creek may require some restoration. It may also supply some stock for the restoration of segment 1. This area is likewise influenced by serpentine although probably less so than the previous segment. This is a better-developed riparian corridor although the canopy cover is broken. Species observed in this reach are listed in Table B.3.

Table B.3. Species observed along riparian survey segment 2 (Knoxville Creek). Asterisks following species names indicate non-native species.

Growth form	Species	Abundance
Tree	<i>Populus fremontii</i>	Two individuals, including one large specimen.
Tree	<i>Quercus lobata</i>	Discontinuous gallery.
Tree	<i>Pinus sabiniana</i>	A few individuals on bank.
Shrub	<i>Sambucus mexicana</i>	One individual on bank.
Shrub	<i>Rhamnus tomentella</i>	Several scattered individuals on bank.
Shrub	<i>Rosa californica</i>	Scattered patches on bank.
Shrub	<i>Rhus trilobata</i>	Frequent in patches on bank
Shrub	<i>Salix</i> spp.	Uncommon.
Perennial	<i>Stachys albens</i>	Scattered in small patches, edge of channel.
Perennial	<i>Scirpus americana</i>	In discontinuous stand in channel.
Perennial	<i>Lepidium latifolium</i> *	Low numbers along channel.
Perennial	<i>Juncus mexicanus</i>	In small patches in channel.
Perennial	<i>Angelica tomentosa</i>	Uncommon along channel.
Perennial	<i>Festuca arundinacea</i> *	In dense patches on banks in open areas.

Segment 3: Lower Eticuera Creek near south end of KWA (Figure B.9).

This area is not markedly influenced by serpentine but rather by the sedimentary geology. The canopy is open with a mixture of *Quercus douglasii*, *Q. lobata* and *Q. wislizenii*. Species observed in this habitat are listed in Table B.4. These species were associated with the above three tree species.

Table B.4. Species observed along riparian survey segment 3 (Eticuera Creek). Asterisks following species names indicate non-native species.

Shrub	<i>Baccharis salicifolia</i>	A few scattered individuals on the streambed.
Shrub	<i>Rhus trilobata</i>	In scattered patches on the bank.
Shrub	<i>Tamarix parviflora</i> *	Scattered seedlings and resprouting stumps.
Shrub	<i>Ailanthus altissima</i> *	In patch in stream.
Shrub	<i>Brickellia californica</i>	Scattered individuals on streambed.
Vine	<i>Clematis ligusticifolia</i>	Few individuals localized on bank.
Perennial	<i>Datisca glomerata</i>	Few individuals scattered on streambed.
Perennial	<i>Helenium puberulum</i>	Uncommon at edge of streambed.
Perennial	<i>Asclepias eriocarpa</i>	Occasional in and along stream.
Perennial	<i>Asclepias fascicularis</i>	Scattered patches or individuals on streambed.
Perennial	<i>Phyla nodiflora</i> *	Scattered individuals + localized patches, streambed
Perennial	<i>Scirpus americanus</i>	In scattered patches on streambed.
Perennial	<i>Heliotropium curassavicum</i>	Uncommon on streambed.
Perennial	<i>Lotus corniculatus</i> *	Scattered patches on stream margin.
Perennial	<i>Xanthium strumarium</i>	Localized in patches on streambed.
Annual	<i>Melilotus albus</i> *	Localized in patches on stream margin.
Annual	<i>Melilotus indicus</i> *	Localized in patches on streambed

Riparian Survey Results—Survey of June-September, 2004

Results of this survey appear in Table B.5.

Table B.5: Species encountered during a survey of Eticuera Creek conducted June 19 through September 4, 2004. The “location” column refers to points mapped in Figure B.10.

Location Fig. B.10	Species
June 19, 2004	
no GPS	Phalaris – 1, 15 ft linear, next to corral.
009	Phalaris and Dactylis, 2, on terrace mixed w/ Perideridia kelloggii and Xanthium str.
010	Phalaris – 1, on floodplain with Asclepias eriocarpa.
011	Phalaris and Dactylis, 2, on terrace with Piptatherum [turtle].
APAN	Phalaris 1, on floodplain.

012	Phalaris + Dactylis, 2, on terrace with Piptatherum and Xanthium str.
013	Phalaris 5, on north slope above creek.
014	Phalaris + Cynodon, 3, on creekbed and bank with Trifolium fragiferum and Lotus corn.
015	Cynodon, Dactylis & 1 Tamarix, 3, on bed and terrace.
016	Dactylis, 4 on bank under QUWI.
017	Populus fremontii, 3, 5-14" trees near rock gap; with pool.
018	Centaurea solstitialis, 5, on bank; Nicotiana bigelovii in creek.
019	Cirsium vulgare, 5, on slide [Luzuli Bunting]; disturbed.
020	Rosa californica, robust stand for collection.
021	Dactylis; Rosa cal. For collection [turn-around' road crossing.
022	Lepidium latifolium, scattered in dense Centaurea solstitialis.
024	Lepidium with Phalaris, 3, terrace and margin of bed.
025	Lepidium lat., 1, band 25' x 4 ft long; creekbed.
026	Tamarix, 2, numerous resprouts.
027	Populus fremontii; post-fire resprouts [large tree north].
028	Tamarix, resprouts 4-5 ft. w/ Glyceria.
029	Malacothamnus helleri, 1 plant at roadside under Glyccirhiza.
July 24, 2004	
032	Festuca arundinacea, (many), Phalaris, 100 ft. +, on lower terrace (numerous 2-3" fish)
No GPS	Glyceria sp., Tamarix (6+ft.); Asclepias fascicularis & A. eriocarpa [Monarch butterflies]
033	Tamarix, 4, resprouts (6-8 ft); Phalaris –few.
034	Tamarix, 2, resprouts; Antirrhinum vex. in riparian woodland; Paspalum distichum.
035	Phalaris, 4, + 1 Tamarix; Centaurea solst. At edge of dry streambed.
036	Tamarix, 6 resprouts, Lepidium – parasitized; gravelbar w/ Phalaris + Centaurea sol.
037	Cynodon dactylon at center of dry channel; Lepidium latifolium – 20 ft patch.
038	Cynodon, 15 ft. strip on streambed.
039	Apocynum cannabinum; Melilotus albus – 50 ft. band.
August 30, 2004	
047	Helianthus bolanderi (exilis), Brickellia cal., Euphorbia supina, Centaurea solst.dense on banks, esp. southwest. Trichostema laxum 36" stems, 32 " tall and 52 " wide. Eremocarpus setigerus on rocky creekbed.
048	Piptatherum mil. – 20 x 10 ft on east bar. Glycyrrhiza, Xanthium str., Cynodon on bed.
No GPS	Asclepias eriocarpa and A. fasc. Crypsis schoen. And Heliotropium cur. On bed. Stachys stricta, Equisetum laev., Helianthus to 50" tall. [bee hives in QULO).
049	(Acc. to 24 ft.) Festuca arundinacea, w/ Melilotus albus 50 x 20 ft. Piptatherum on inside bar, Cynodon on bed in patches 5-15 ft across. Datisca, Salix, Juncus mex., Cornus glabrata, QULO, Scirpus pungens –

	1 plant 42" tall. <i>Apocynum cannabinum</i> (previous collection site ?).
050	<i>Melilotus albus</i> – 45 x 6 ft. on east streamside. <i>Vitis californica</i> , <i>Asclepias eriocarpa</i> , <i>Leymus triticoides</i> , <i>Artemisia douglasiana</i> on bank. <i>Xanthium strumarium</i> and <i>Crypsis shoen.</i> On bed.
051	<i>Cynodon</i> , <i>Crypsis shoen.</i> on bed. QUWI, <i>Helianthus bolanderi</i> , <i>Xanthium strum.</i> , <i>Brickellia</i> – few. <i>Phalaris aquatica</i> on bars. <i>Piptatherum</i> on bed and bank, scattered. <i>Lepidium latifolium</i> on bed in open stand. <i>Centaurea solst.</i> on west bar with <i>Hirshfeldia</i> .
052	<i>Melilotus albus</i> scattered. <i>Juncus oxymetris?</i> <i>Juncus mexicanus</i> , <i>Hoita macrostachya</i> , <i>Scirpus pungens</i> . <i>Piptatherum</i> on inside bar with <i>Phalaris aquatica</i> – open stand. <i>Datisca glomerata</i> .
053	Road crossing. Pool with fish. <i>Typha latifolia</i> ? <i>Melilotus albus</i> . <i>Salix lasiolepis</i> recruitment. <i>Helenium puberulum</i> . <i>Equisetum laevigatum</i> on bed. <i>Marrubium vulgare</i> – one plant.
054	<i>Centaurea solstitialis</i> on east side bar. <i>Brickellia</i> , <i>Solidago canadensis</i> (?) 48" tall. <i>Asclepias fascicularis</i> – 45" tall. <i>Datisca</i> – 7' tall, dormant. <i>Piptatherum miliaceum</i> and <i>Melilotus albus</i> – dense on gravel bar. Pool – 60 ft long and about 3 ft deep. <i>Salix</i> dominant. <i>Baccharis salicifolia</i> .
055	<i>Phalaris aquatica</i> , <i>Melilotus</i> on bank – 25 x 8 ft. <i>Scirpus pungens</i> , <i>Equisetum laevigatum</i> on bed. <i>Vitis</i> , <i>Salix</i> , <i>Rhus</i> , QULO, <i>Artemisia douglasiana</i> , <i>Juncus mexicanus</i> .
056	<i>Melilotus</i> dense on both sides of creek, <i>Helianthus bolanderi</i> – 6 ft tall.
057	<i>Tamarix</i> – 2 resprouting stumps. <i>Clematis ligusticifolia</i> . <i>Phyla nodiflora</i> on bed. <i>Eriodictyon</i> on bar. <i>Eriodictyon</i> on bar. <i>Centaurea solstitialis</i> on bed and bar with <i>Piptatherum</i> and <i>Melilotus albus</i> . <i>Rubus ursinus</i> , <i>Cercis occidentalis</i> . Pool at inlet of tributary channel. <i>Equisetum laevigatum</i> – common. Frogs numerous [body 1" long; banded on hindlegs, 3 dark]. <i>Populus fremontii</i> . Stream flow.
058	<i>Scirpus pungens</i> – dense. Few <i>Xanthium</i> . <i>Hoita</i> . Macro., <i>Salix</i> , <i>Rhamnus californica</i> , <i>Holodiscus discolor</i> , <i>Rubus ursinus</i> , <i>Cercis occidentalis</i> .
059	<i>Robinia pseudo-acacia</i> – 4 trees and few saplings. <i>Melilotus albus</i> – in patches. Plants mostly native here – <i>Datisca</i> , <i>Salix</i> , QULO, <i>Rubus ursinus</i> , <i>Scirpus pungens</i> , <i>Hoita macro.</i> , VICA.
060	<i>Melilotus albus</i> – dense band on both banks to south. Continuous stretch of surface water; numerous 3" long fish and frogs. Quail, water snake.
061	<i>Tamarix</i> – resprouting stumps. <i>Melilotus</i> still in band on banks here. Bees in oaks. End of surface water. <i>Typha</i> . House wren?
062	<i>Tamarix</i> – 7 resprouting stumps about 30 ft apart and to 8 ft tall. <i>Populus</i> , <i>Xanthium</i> , <i>Eremocarpus</i> , <i>Glycyrrhiza</i> patch 50 ft x 15 ft. <i>Heliotropium</i> . Some <i>Centaurea solstitialis</i> on bed. <i>Brickellia</i> . Black <i>Phoebe</i> . <i>Asclepias fascicularis</i> and <i>A. eriocarpa</i> scattered. <i>Cynodon</i> patches.
No GPS	<i>Piptatherum</i> and <i>Melilotus</i> on west bank with few <i>Phalaris</i> – 100 x 25 ft.
063	<i>Tamarix</i> – 7 resprouting stumps 8 ft tall with <i>Melilotus albus</i> to 8.5 ft tall. <i>Clematis ligusticifolia</i> . Small <i>Populus fremontii</i> – 12 ft tall.

064	Lepidium – 1 vegetative plant. Melilotus in dense band at edge of stream bed. Pool 15 x 10 x 1 ft deep. Helianthus bolanderi – 88” tall.
065	Tamarix – resprouting stump 9 ft tall. Melilotus albus still in dense swath on both sides of stream. Lepidium latifolium in vegetative patch 5 ft circle.
066	Road crossing. Paspalum distichum, Typha domingensis – extensive stand, Equisetum laevigatum, Lotus corniculatus, Trifolium fragiferum on bar.
067	Melilotus albus (dry) – in dense band on west stream edge. Lepidium latifolium – few plants on stream bed. Solid bed rock along section of stream bed here.
068	Tamarix – resprouting stump, 4 ft tall. Phyla, Paspalum distichum, Melilotus band, Phalaris aquatica scattered. Piptatherum . Lepidium on west bank. Sonchus asper rosettes on bed.
069	Phyla, Lepidium lat., Crypsis shoen. on bed. Populus saplings. Salix lasiolepis, S. exigua, Artemisia douglasiana, Heliotropium, Brickellia, Stachys stricta.
070	Tamarix – one resprouting stump, 8 ft tall. Datisca, QUDU, Salix, Scirpus pungens.
071	Populus – one tree – 20-25 ft tall. Carex nudata? on bank and bed. Perideridia kell. – few on bank. Helenium puberulum, Rhamnus californica. Cynodon, Phyla in patches on stream bed.
072	Tamarix – 2 resprouting stumps, 5-10 ft tall.
073	Tamarix – 5+ reprouting stumps. Melilotus albus, Phalaris aquatica. Lepidium – scattered. Xanthium, Phyla, Cynodon, Piptatherum, Helianthus bolanderi. Asclepias eriocarpa on bed.
Stop	About 100 yds south of mile 26.00 sign on road.
September 4, 2004	
074	Amaranthus blitoides on bed. Melilotus indicus (small patch), Euphorbia serpyllifolia, Phyla, Eremocarpus setigerus on bed. Rosa californica on bank. Heliotropium curasavicum, Hoita mac. on bed.
075	Tamarix parviflora – 7 resprouting stumps. Melilotus albus on both banks – broken to solid band, 5-15 ft wide. Rhamnus tomentella, scattered on west bank. Helianthus bolanderi (exilis) – 1 plant . Crypsis shoenoides on bed. Asclepias eriocarpa on rocky bank (36” tall). Xanthium strumarium scattered on bed.
076	QULO, QUWI, Datsica, Artemisia douglasiana, Brickellia californica, Solidago canadensis? Clematis ligusticifolia. TODI. Piptatherum – 6-8 ft on bar. Phalaris aquatica – scattered. Centaurea solstitialis on bar. Dactylis glomerata – few on bar. Helianthus bolanderi (exilis) – few on bar. Hirshfeldia incana on bar. Xanthium, Eremocarpus, Trichostema laxum – few.
077	Lepidium latifolium – small patch, 6 ft circle on east edge of bed. QULO. Phalaris – few. Melilotus albus – in continuous to broken band 3-15 ft wide. Asclepias eriocarpa (42” tall, with heavy aphid infestation). Centaurea solstitialis – scattered on bed. Datisca, Antirrhinum vexillo-calyculatum – 1 plant on bed.

078	Tamarix – few young plants. <i>Lepidium latifolium</i> – patches. <i>Populus fremontii</i> sapling 8 ft tall. <i>Equisetum laevigatum</i> on bed. <i>Brickellia</i> – few. <i>Asclepias eriocarpa</i> on cobbly bed. <i>Phyla</i> , <i>Cynodon</i> – in patches 2-8 ft across. <i>Melilotus albus</i> – scattered. <i>Xanthium</i> scattered on bed. QULO, <i>Salix</i> (young). <i>Brickellia</i> – stem to 57 “ long. <i>Verbena lasiostachys</i> – few on bed. <i>Phalaris</i> , <i>Piptatherum</i> – scattered on bed. <i>Helianthus</i> – 72” tall. Pool 12 x 20 ft. with 2” long fish (water brown).
079	<i>Lepidium latifolium</i> – patch 15 x 20 ft. in mid-stream. <i>Melilotus albus</i> on bar (dense). <i>Tamarix</i> (2). <i>Piptatherum</i> on bar. <i>Asclepias eriocarpa</i> – common on vertical NW bank.
080	<i>Tamarix</i> – 1 resprout. <i>Melilotus albus</i> – dense on SE bank w/ <i>Piptatherum</i> scattered. <i>Paspalum distichum</i> , <i>Cynodon dactylon</i> on bed. <i>Scirpus pungens</i> patchy. <i>Populus fremontii</i> sapling 3 ft tall. <i>Eleocharis macrostachys</i> (?) on bed – small patches.
081	<i>Populus fremontii</i> – 4 saplings 4-8 ft tall. <i>Scirpus pungens</i> , <i>Salix laevigata</i> . <i>Melilotus albus</i> on bar (no bank here). <i>Xanthium</i> , <i>Datisca</i> , QULO. <i>Paspalum</i> and <i>Cynodon</i> patchy on bed. <i>Typha</i> – patchy.
082	Pool 15 x 10 ft (water brown) – 2 Aquatic Garter Snakes observed (photo), bees, water striders (many). QULO, QUWI, TODI, <i>Rhus trilobata</i> , <i>Symphoricarpus albus</i> , <i>Rhamnus tomentella</i> . <i>Xanthium</i> , <i>Hoita macrostachya</i> , <i>Datisca</i> . <i>Melilotus albus</i> in broken band on west edge of stream. <i>Helenium puberulum</i> , <i>Phyla</i> on bed. <i>Carex nudata</i> – scattered individuals. <i>Asclepias fascicularis</i> .
083	Pool – mossy, 20 x 12 ft., bees collecting mud? QULO. <i>Hoita</i> , <i>Glycyrrhiza</i> . <i>Melilotus albus</i> in broken patches on bar. <i>Asclepias eriocarpa</i> , <i>Datisca</i> , <i>Stachys stricta</i> (few). <i>Lepidium latifolium</i> – 40 x 15 ft patch – open.
084	<i>Tamarix</i> – 1 resprout (8 ft). <i>Rosa californica</i> . <i>Lotus corniculatus</i> on bed. <i>Helianthus exilis</i> (1). <i>Lepidium latifolium</i> – vegetative, 4 ft circle. <i>Phyla</i> , <i>Clematis ligusticifolia</i> .
085	<i>Tamarix</i> – 1 resprout (4 ft). <i>Lepidium latifolium</i> – 15 ft patch. <i>Populus fremontii</i> – 1- 10ft sapling. <i>Phyla</i> on bed. <i>Melilotus albus</i> – broken band on west bank. <i>Helenium</i> , <i>Piptatherum</i> on east bank. <i>Crypsis</i> , <i>Cynodon</i> on bed. <i>Hoita</i> . <i>Carex nudata</i> more common here. <i>Equisetum laevigatum</i> in patches.
086	QULO, QUWI, PISA, w? VICA, HEAR, <i>Ceanothus oliganthus</i> , <i>Keckiella lemmonii</i> , <i>Rosa californica</i> , <i>Salix</i> , <i>Melilotus albus</i> – broken bank on both banks, 5-15 ft wide. <i>Datisca</i> , <i>Baccharis salicifolia</i> , <i>Xanthium</i> , <i>Phyla</i> , <i>Heliotropium</i> , <i>Carex nudata</i> , <i>Clematis ligusticifolia</i> , <i>Cercis occidentalis</i> .
087	<i>Tamarix</i> – 3 resprouts. <i>Lepidium</i> – 10 patch. <i>Brickellia</i> , <i>Cynodon</i> in patches. <i>Fraxinus latifolia</i> I(1 tree), AECA (1), <i>Phyla</i> , <i>Carex nudata</i> . QULO/ PISA. <i>Lotus corniculatus</i> . <i>Marrubium vulgare</i> (1). <i>Helianthus exilis</i> . <i>Trichostema laxum</i> (1). <i>Heliotropium</i> , <i>Crypsis</i> on bed.
088	(poor GPS coverage, +/- 65 ft.) <i>Tamarix</i> – 2 resprouts (8 ft.) QULO-PISA-QUWI. <i>Salix lasiolepis</i> , <i>Scirpus pungens</i> . <i>Phalaris</i> scattered on bank. <i>Piptatherum</i> scattered. <i>Melilotus albus</i> – patches. <i>Paspalum</i> on

	bed.
089	QUDO/ PISA-QULO. Melilotus albus on bar, 15 ft. band. Scirpus pungens, Salix lasiolepis (many young volunteers). Asclepias eriocarpa on bar. Juncus mexicanus. Lepidium latifolium – vegetative plants (4ft tall). Fraxinus dipetala on west bank. Equisetum laevigatum.
090	QUDO – open. Melilotus albus in broken band on both banks. Scirpus pungens common on bed. Xanthium, Helianthus (1), Cercis (1). Eleocharis in patch. Crypsis on bed. Ailanthus ? on slope. Equisetum laevigatum in patch. Datisca, Phyla, Cynodon in small patches. Trichostema laxum (1) Polypogon, Juncus mexicanus in patches.
091	(coverage returned to +/- 30 ft.) Tamarix – 15 + resprouting plants. Lepidium 8 x15 ft. Cynodon dactylon. Meliloyus albus dense on bar. Juncus mexicanus. Phyla, Xanthium, Hoita, Heliotropium, Asclepias eriocarpa. Lotus corniculatus. Piptatherum – scattered.

Figure B.9. Locations of riparian surveys conducted at the Knoxville Wildlife Area.

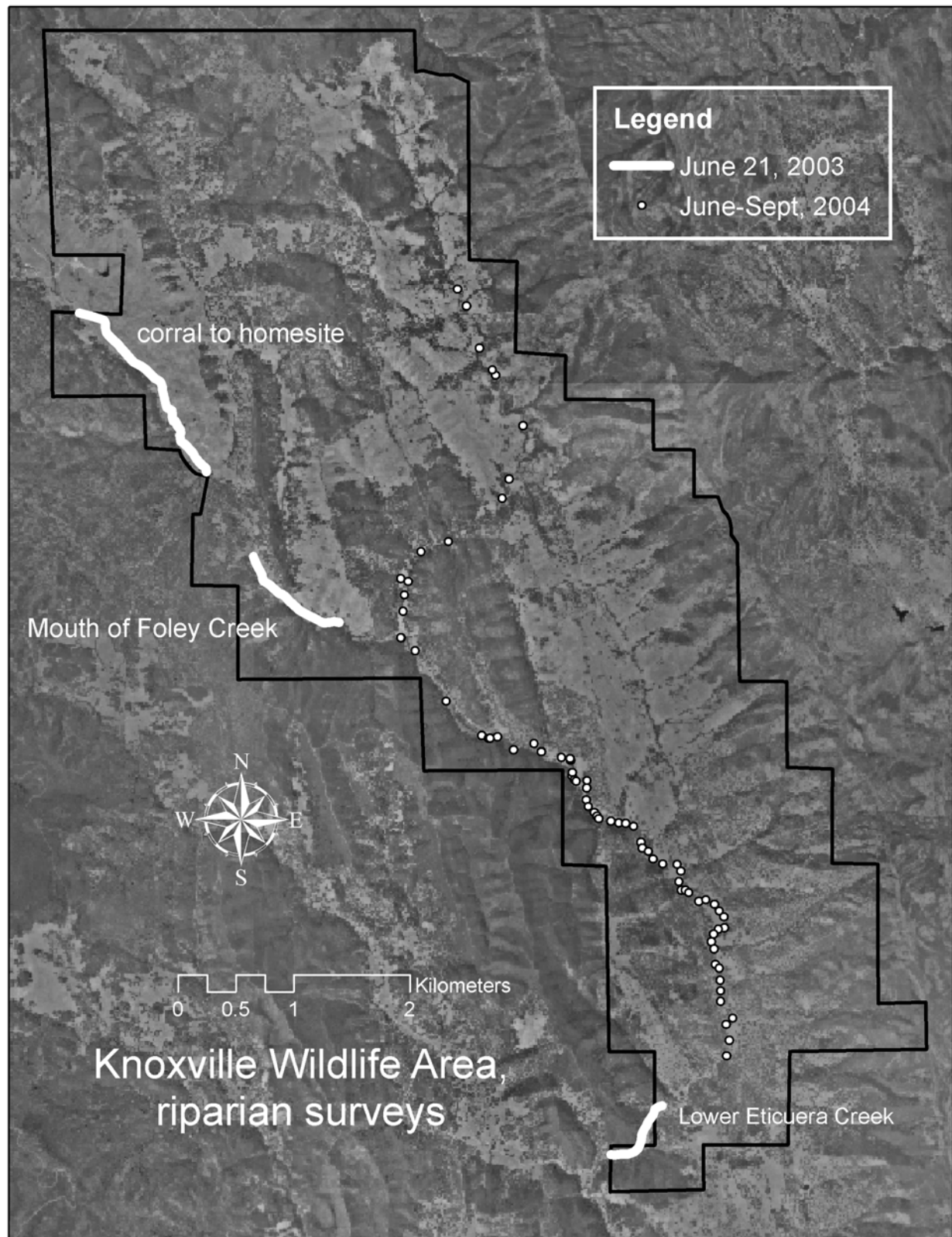


Figure B.10(A). Detail of Eticuera Creek Survey (June-Sept 2004). Numbers key to locations indicated in Table B.5.

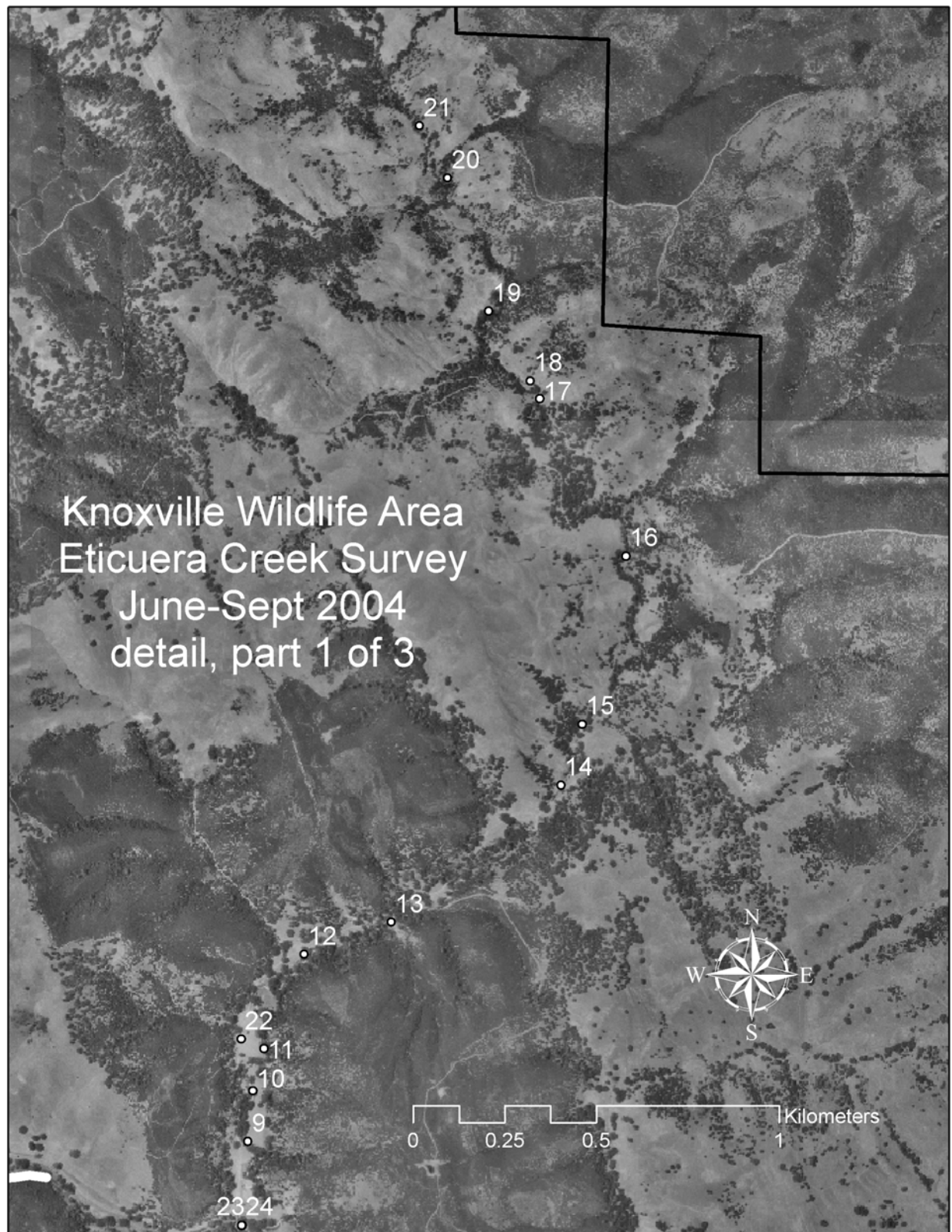


Figure B.10(B). Detail of Eticuera Creek Survey (June-Sept 2004). Numbers key to locations indicated in Table B.5.

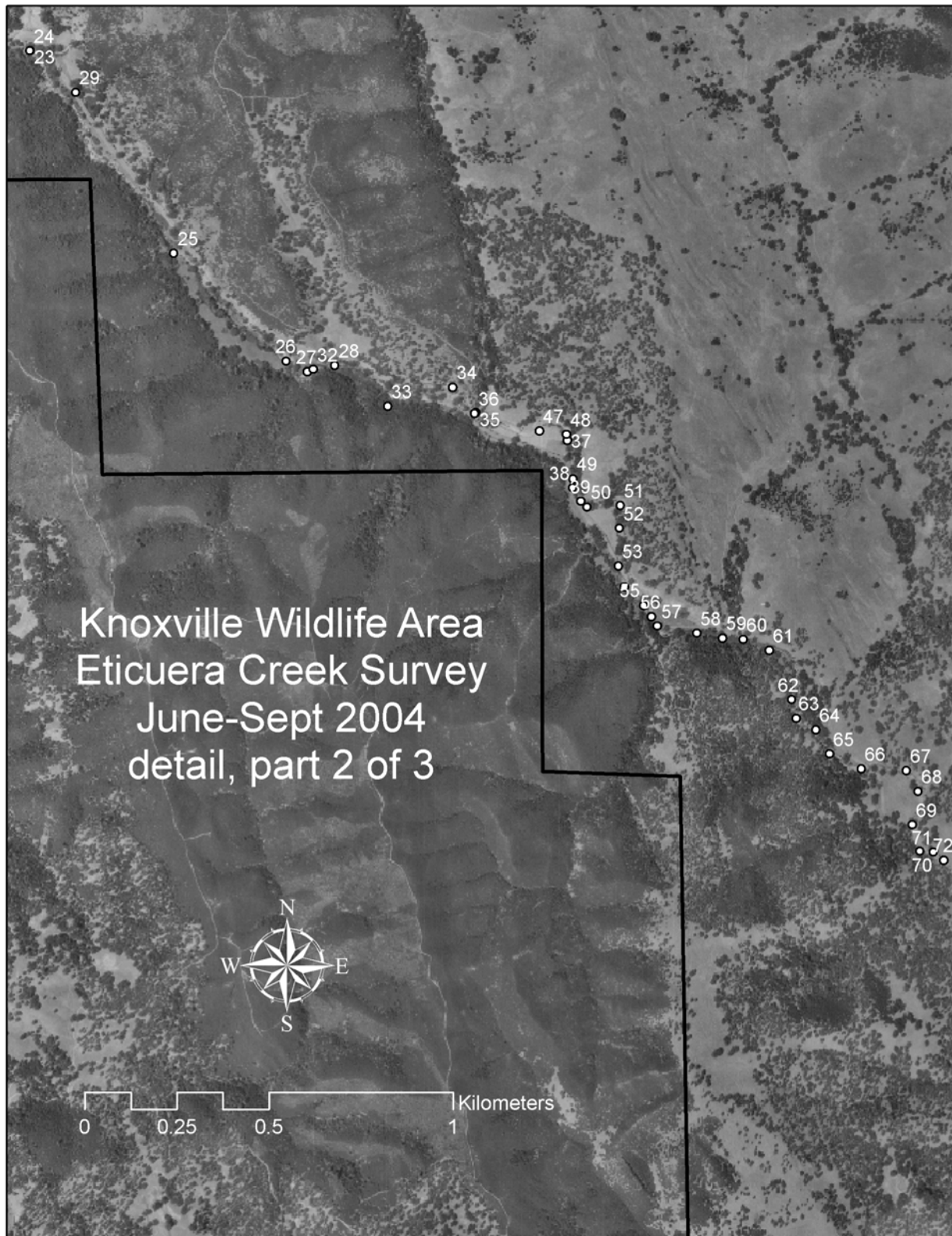
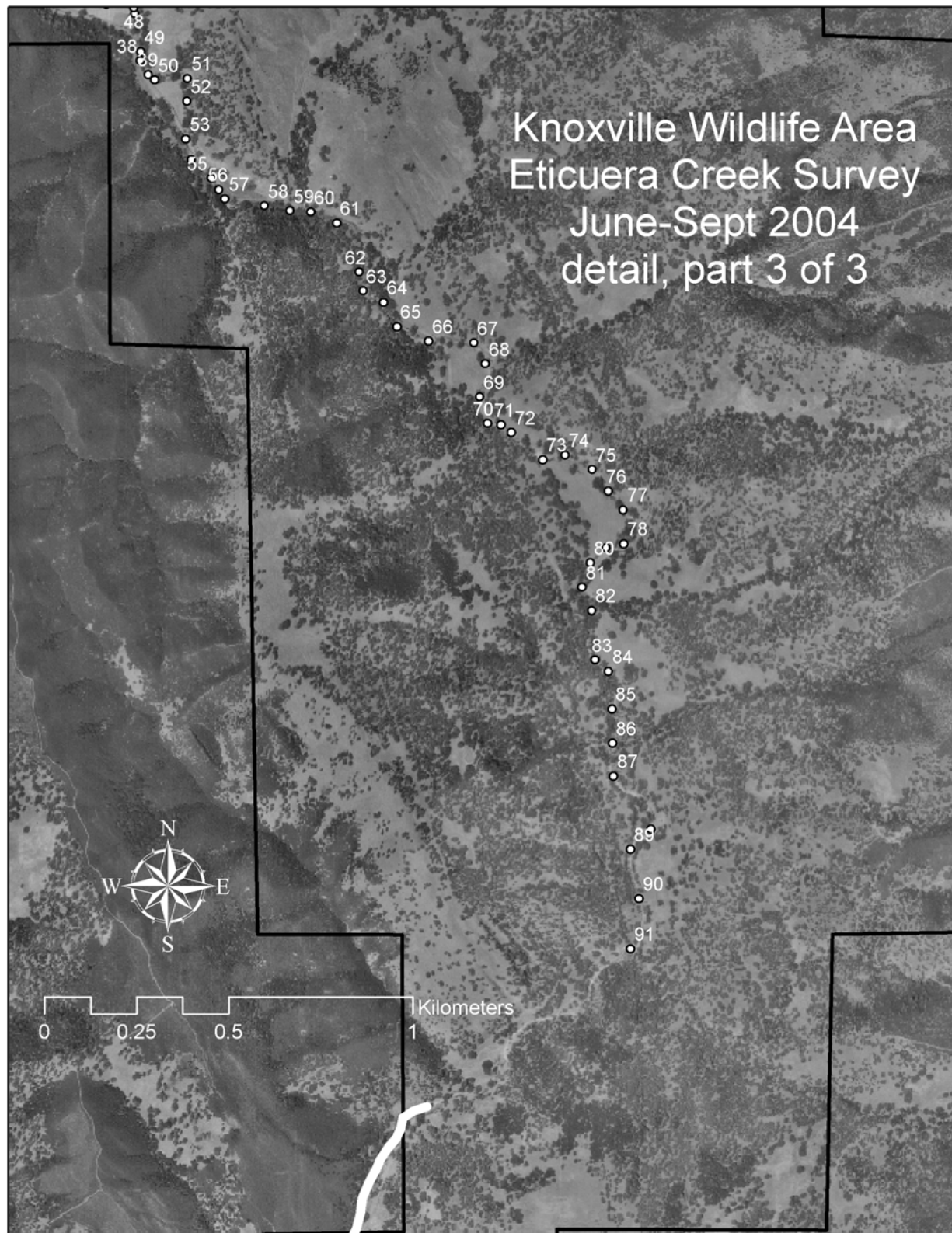


Figure B.10(C). Detail of Eticuera Creek Survey (June-Sept 2004). Numbers key to locations indicated in Table B.5.



❖ Surveys for Special Status Plants

Special Status Plants Survey Methods and Results

The KWA is an expansive property, and due to the size, ruggedness, and density of vegetation, a rare plant survey according to DFG guidelines is cost prohibitive. Therefore, the survey focused on habitat types where rare plants had previously been seen by Jake Rugyt. Thus, the ridge top of the Blue Ridge and vegetation types occurring on serpentine substrate were given special focus. The occurrence of a large fire in 2000 also facilitated greater understanding of post fire vegetation in this region particularly with regards to the distribution of *Malacothamnus helleri*, one of the special status species. Surveys focused on collecting distributional data on all California Native Plant Society special status species from those that are considered Rare & Endangered to those of limited distribution (List 4). It had also been requested by DFG management that species of local rarity receive attention. There are no known state or federally listed plants within the KWA or surrounding area.

The bulk of the KWA was surveyed by walking the many miles of jeep trails that transect the ridges and follow Foley and Long Canyon creeks. Old fire trails were utilized to access the Blue Ridge but the current condition of these required some brush bashing. Some cross-country hikes were conducted to insure visitation of plant communities occurring on the range of slope exposures. The size of the KWA also necessitated coverage of fractions of the property on a given survey date. Searches were conducted throughout the flowering season during 2003 and more periodically during 2004. Following the acquisition of ICE vegetation maps, some effort was made to verify the occurrence of Valley Oak Alliance (limited in Napa County) and to visit some vegetation types possibly not encountered during 2003 surveys, including some of the undetermined (9999) vegetation types plotted on the ICE maps. Most of the field searches were conducted alone, with assistance from Cathy Koehler, Paul Aigner and Dr. Susan Harrison in the spring of 2003. The following survey dates were utilized to complete the survey. A list of all plant species encountered during the field searches was recorded.

March 8, 21, 31; April 9, 14, 22, 26; May 5, 24; June 21; July 5 of 2003.
March 27; April 3, 10; May 9; June 12, 19; July 24 of 2004.

During this time approximately 75.5 hours were spent in the field. About 4 of these hours were spent on cursory examination of three outlying parcels.

Special status plants that were found in this survey are described in Chapter III of this plan and are mapped in Figures B.11. (omitted from public copy).

Figure B.11(A). deleted from this copy

Figure B.11(B). deleted from this copy

❖ **Herptile Surveys**

Herptile surveys were conducted to document species presence. Primary targets were aquatic herptiles, amphibians in particular. No surveys targeted snakes or lizards. Two primary survey methods were used: road surveys and area searches.

Road Survey Methods

These surveys primarily targeted newts, but also allowed for detection of frogs and other herpetofauna that may cross the road. Because Berryessa-Knoxville Road follows and frequently crosses the course of Knoxville/Eticuerra Creek, road surveys had the potential of encountering any animals that were moving between the creek and adjacent upland habitats (primarily Blue Oak Woodland). Road surveys were conducted by automobile during rainy weather. Two people (one driver/spotter, one spotter/handler) drove slowly along Berryessa-Knoxville Road between the north and south entry points of the Knoxville Wildlife Area, sighting amphibians on the road. In the daytime, no additional light sources were used to sight animals on the road. At nighttime, vehicle headlights and spotlights were used. Each amphibian encountered was captured by hand by the handler, identified to species (unless otherwise noted), and released on that side of the road in the direction that the animal was initially traveling. A total of three road surveys were conducted, one during the day, and two at night.

Area Search Methods

These surveys were aimed primarily at finding breeding frogs. Areas likely to support breeding frogs were visited near or after dusk on nights when it was not raining. Target areas included ponds of the KWA and sections of Knoxville/Eticuerra Creek and were chosen in order to maximize likelihood of encountering Red Legged Frogs and Yellow Legged (respectively), if present. Surveyors worked in pairs. Upon arrival at a location, surveyors remained quiet and still for long enough to allow frogs to begin calling again. An auditory assessment of frog species was then conducted, following which surveyors waded around the edges of the pond or along the course of the creek and spotted animals or their eye-shine using flashlights and headlamps. Animals that were spotted were approached or captured and identified to species when possible.

Herptiles were identified to species using several methods:

- Newts were identified to species by inserting a blunt probe into the corner of the mouth, prying open the jaws, and observing the pattern and location of the palatine teeth, by assessing the location of the eyes with respect to the jaw-line in dorsal view, and by noting the skin color patterns. Information on identification methods was obtained from Brad Shaffer (UCD professor of evolution and ecology) and the Field Guide to Western Reptiles and Amphibians, Second Edition, by Robert C. Stebbins.

- Frogs were identified by call and by physical markings. Some individuals were caught for in-hand verification. Information on identification methods, calls, and habitat assessment was obtained from various websites including:
<http://ice.ucdavis.edu/CANVDecliningAmphibians/Tour.htm>
http://www.amphibiaweb.org/cgi-bin/amphib_query?special=call&genus=Rana&species=boylei
<http://www.biology.mcgill.ca/undergra/c465a/biodiver/2002/red-legged-frog/redlegged.htm>
 and the Field Guide to Western Reptiles and Amphibians.
- Western Pond Turtles were identified by sight and caught for in-hand verification. Information on identification was obtained from the Field Guide to Western Reptiles and Amphibians.

Herptile Survey Results

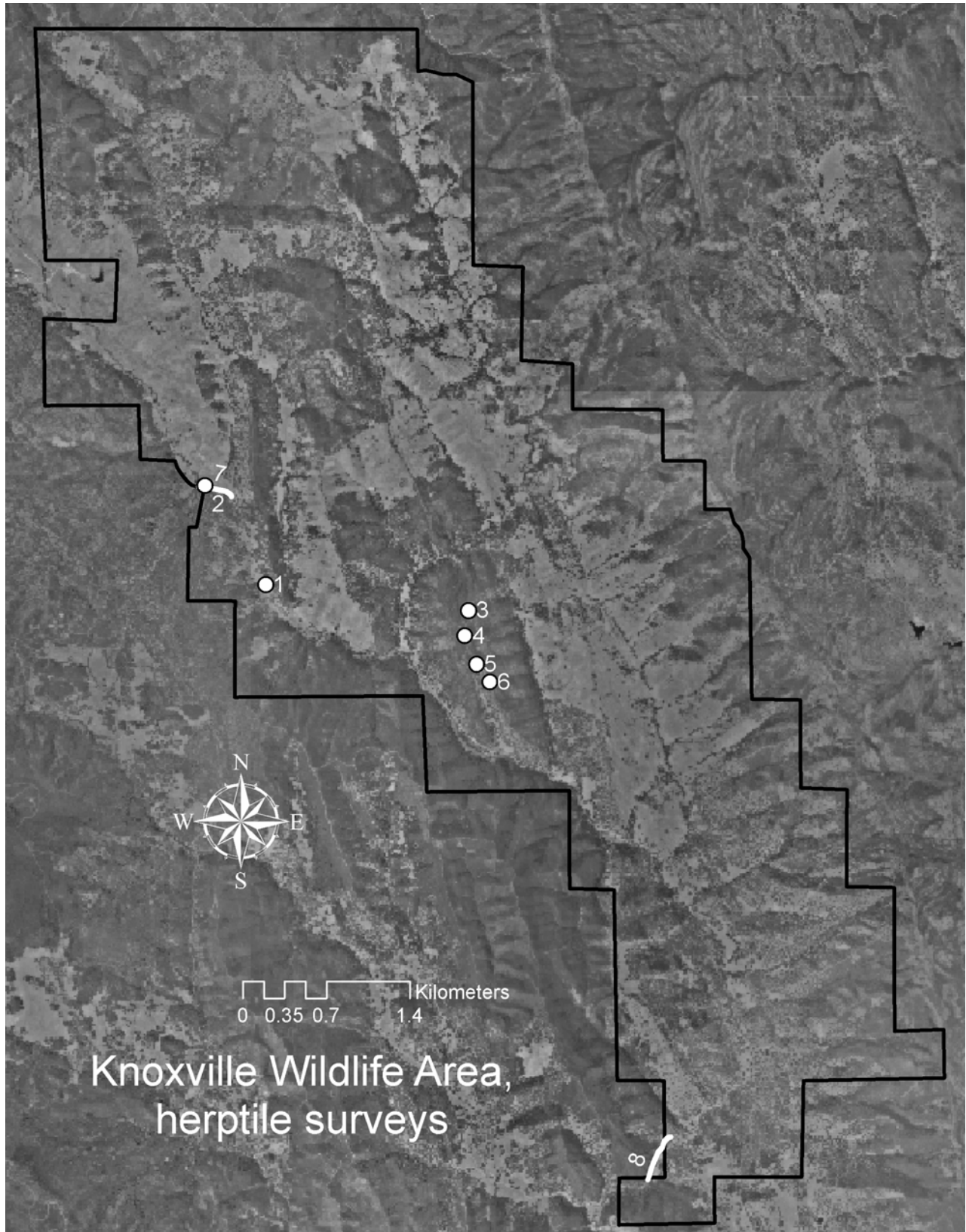
Results of herptile surveys are presented in Table B.5. This table includes incidental detections of animals that occurred outside of formal surveys. Locations for area searches and incidental detections are given in Figure B.12. Species detected include the California newt, bullfrog, foothill yellow-legged frog, pacific treefrog, and common garter snake.

Table B.5: Results of herptile surveys.

Survey Method	Date	Time	Location	Map number in Fig. B.9	Herpetofauna encountered, habitat notes when applicable
Road Survey	Dec.13 2002	1312-1350 h	Berryessa-Knoxville Rd., south cattle grate to northern corral	n.a.	11 live newts 2 freshly killed newts (species not identified, although likely California Newt)
Road Survey	28 Nov. 2003	1816-2023 h	Same as above	n.a.	California newts 28 live 23 freshly killed
Road Survey	19 Dec. 2003	2111 – 2315 h	Same as above	n.a.	California newts 87 live 10 freshly killed
Area Search	4 Feb. 2004	1800 – 2000 h	Knoxville Creek oxbow and creek bed across from oxbow	1	Pacific treefrogs (chorusing and visual ID) California newt
Area Search	4 Feb. 2004	2015 - 2035	Creek bed across from homestead ruins	2	No animals.
Incidental	23 Feb. 2004	1815 (brief visit)	Reservoir 20 in pond and reservoir inventory	3	Pacific tree frogs chorusing. Unlikely red-legged frog habitat (no emergent vegetation; chamise surrounding pond).
Incidental		1820	Reservoir 19 in pond and reservoir inventory	4	Pacific tree frogs chorusing. Unlikely red-legged frog habitat (no emergent vegetation; chamise surrounding pond).
Incidental		1825	Reservoir 18 in pond and reservoir inventory	5	Pacific tree frogs chorusing in pond. Did not examine pond.
Area Search		1830 - 1945	Reservoir 17 in pond and reservoir inventory	6	Pacific tree frogs chorusing. No emergent vegetation in pond; surrounded by Blue Oak woodland. Visual confirmations (survey of pond shallows with headlights): 1 common garter snake 10 California newt / 1 larval newt 50 Pacific tree frogs
Area Search	14 March 2004	2000 - 2150	200 m stretch of Creek downstream of homestead ruins	7	Occasional calling pacific tree frogs encountered. 8 foothill yellow-legged frogs encountered, calling and visual (most captured for confirmation)
Area Search		2230 - 2330	200 m stretch of Creek upstream from South border Cattle Grate	8	Many calling Pacific tree frogs, 3 seen. 1 bullfrog 1 western pond turtle

					14 California newts
Incidental	Spring 2003	Midday	Oxbow and creek water crossings	1	western pond turtles (multiple sightings)

Figure B.12. Herptile survey locations referenced in Table B.5.



❖ **Pond and Reservoir Inventory**

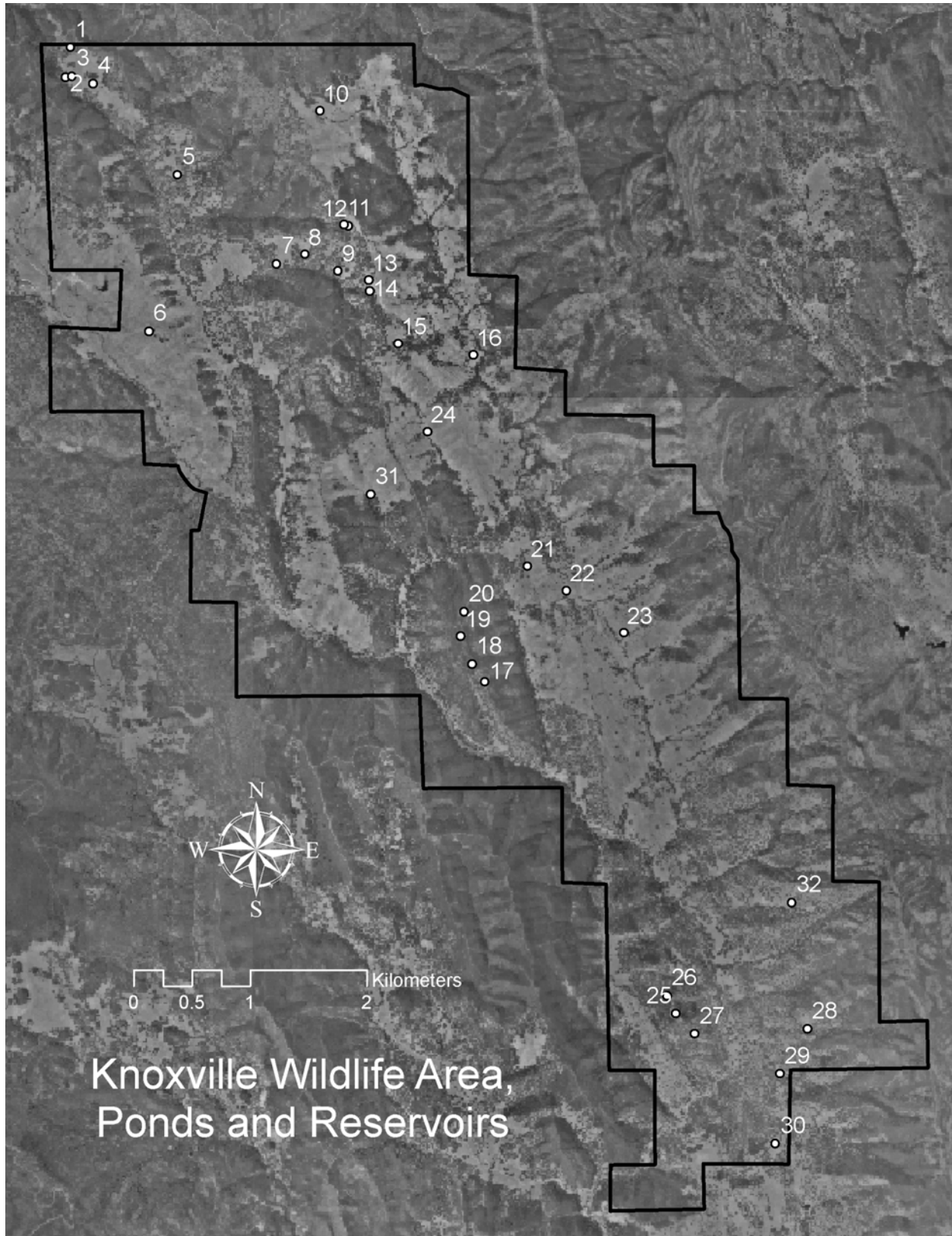
Approximately 32 reservoirs exist within the Knoxville Wildlife Area. All of these (with the possible exception of one) are man-made impoundments for stock watering. Twenty six of these reservoirs were visited (by Paul Aigner and Cathy Koehler) in 2003 and 2004. Each reservoir was photographed and notes were taken about the vegetation occurring within and around the pond, the condition of the dam, and the extent of erosion. Table B.3 summarizes these notes. Reservoirs are mapped and numbered in Figure B.10, and photographs corresponding to numbers on the map follow.

Table B.6. Characteristics of reservoirs and ponds at the Knoxville Wildlife Area.

Num.	Vegetation	Water holding	Erosion	Other comments
1	No emergent vegetation	Good, no obvious dam	None	Possibly natural
2	No emergent vegetation	Poor, dam breached	Substantial at and below dam	Harding grass and star thistle on dam.
3	Some creeping spikerush (<i>Eleocharis macrostachya</i>)	Poor, dam breached	Substantial at and below dam	Some Harding grass
4	Creeping spikerush in center	Poor, although dam is intact; dry by April	None	No star thistle or weeds other than <i>Bromus diandrus</i> and other widespread annual grasses
5	No emergent vegetation	None. Was originally a small impoundment and now dam is breached	None	
6	No emergent vegetation	Poor, dam breached	Substantial below dam	
7	Some creeping spikerush	Good, water in July	None	
8	No emergent vegetation	Poor to none, dam breached	Some below dam	
9	No emergent vegetation	Poor, dam breached	Some below dam	
10	Abundant spikerush, <i>Juncus</i> sp., small patch of cattail	Good, one of the largest ponds at the KWA	Some on dam	Abundant star thistle on and below dam. Some bull thistle below dam. Spillway has a culvert. Dam is in danger of washing out in the center
11	Some creeping spikerush	Moderate. Dam intact, but dry in July	None	This is the upper of two adjacent ponds.
12	Abundant creeping spikerush	Good. Dam intact. Contains water in July	None	This is the lower of two adjacent ponds.
13	None	Poor	Slight at spillway	
14	Some creeping spikerush	Moderate. Dam intact,	None	

		but dry in July		
15	Some creeping spikerush, <i>Juncus</i> sp.	Moderate, dam has small blow out	Some at dam	Harding grass in pond and below dam
16	No emergent vegetation. Some <i>Heliotropum</i> sp.	Poor, dam intact, but dry in July	None	Dense yellow starthistle around pond
17	None	Good	Substantial in drainage below dam	
18	Cattail around margin	Good	None	
19	Cattail around margin	Good	None	
20	None	Good	None	
21	Some creeping spikerush	Poor, dam breached	None	Reservoir #1 on the Water License
22	Pond surrounded and filled with dense cattails and creeping spikerush	Moderate. No standing water in July but muddy in the center	None	Reservoir #2 on the Water License
23	Some creeping spikerush	Poor, dam intact, dry in July	None	
24	Abundant creeping spikerush	Good, dam intact	Some at spillway	Some Harding grass around pond and on slope opposite road.
25	Not visited			Reservoir #3 on the Water License?
26	Not visited			
27	Not visited			
28	Not visited			
29	Not visited			
30	Not visited			
31	Pond viewed only from a distance	Moderate, dam breached	Substantial at and below dam	Harding grass around pond
32	None	Poor, dam intact, dry in July	None	

Figure B.13. Ponds and reservoirs at the Knoxville Wildlife Area.



Pond 1, photographed April 10, 2004.



Reservoir 2, photographed April 10, 2004.



Reservoir 3, photographed April 10, 2004. Lower photo shows erosion below dam.



Reservoir 4, photographed April 10, 2004.



Reservoir 5, photographed April 10, 2004.



Reservoir 6, photographed Dec 18, 2003. Lower photo shows erosion below dam.



Reservoir 7, Photographed April 10 (above) and July 13 (below), 2004.





Reservoir 8, photographed July 13, 2004.



Reservoir 8, breach in dam, July 13, 2004.

Reservoir 9, photographed July 13, 2004.



Reservoir 10, photographed July 13, 2004.



Reservoir 11, photographed July 13, 2004.



Reservoir 12, photographed July 13, 2004. The dam of reservoir 11 is in the background.



Reservoir 13, photographed July 13, 2004. Lower photo shows some erosion at dam.



Reservoir 14, photographed July 13, 2004.



Reservoir 15, photographed July 13, 2004.



Reservoir 16, photographed July 13, 2004.



Reservoir 17, photographed March 13, 2004.



Reservoir 18, photographed March 13, 2004.



Reservoir 19, photographed March 13, 2004.



Reservoir 20, photographed March 13, 2004.



Reservoir 21, photographed July 13, 2004.



Reservoir 22, photographed July 13, 2004.



Reservoir 23, photographed July 13, 2004.



Reservoir 24, photographed July 13, 2004.



Reservoir 31, photographed March 13, 2004.



Reservoir 32, photographed July 13, 2004.



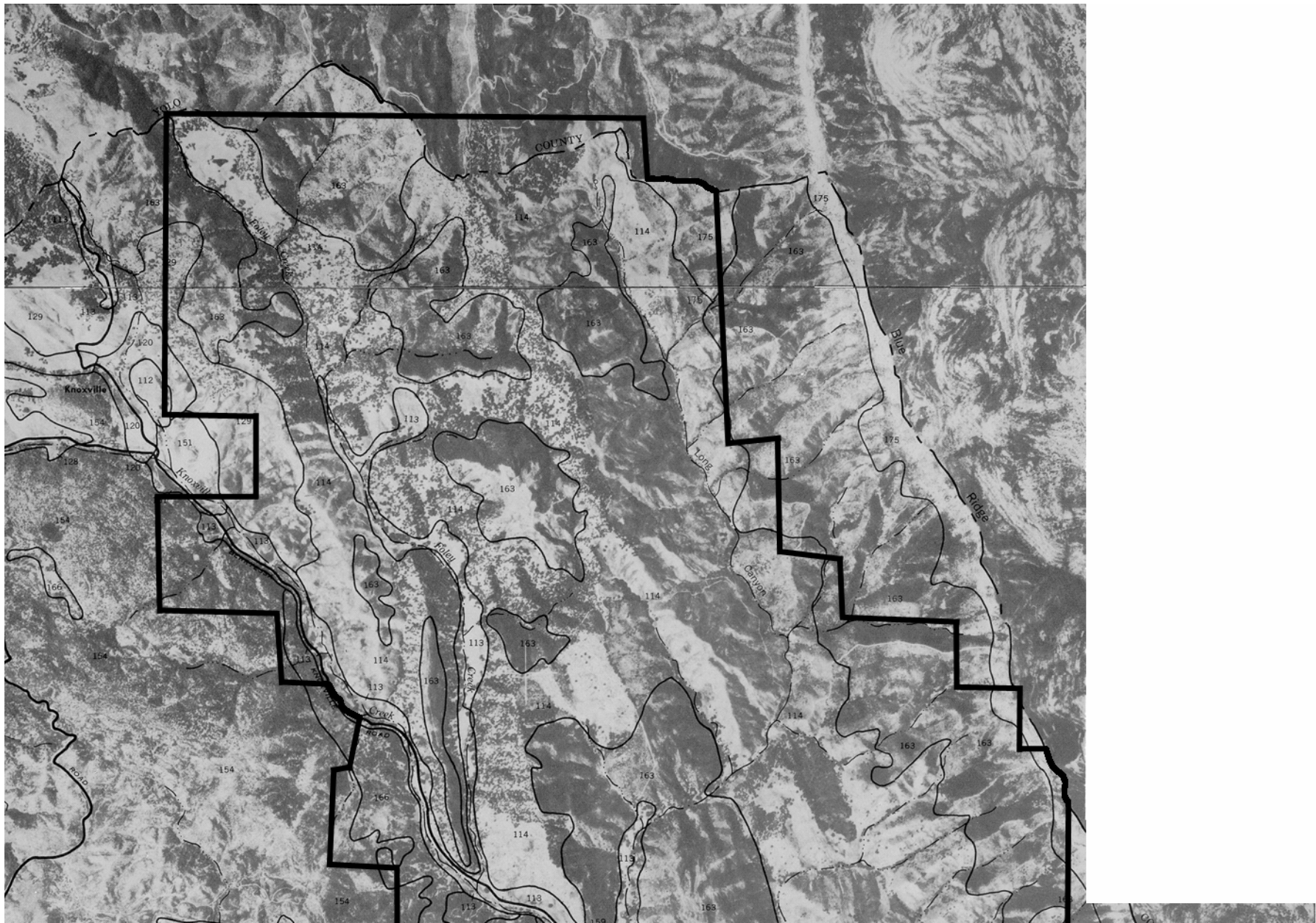
Appendix C.

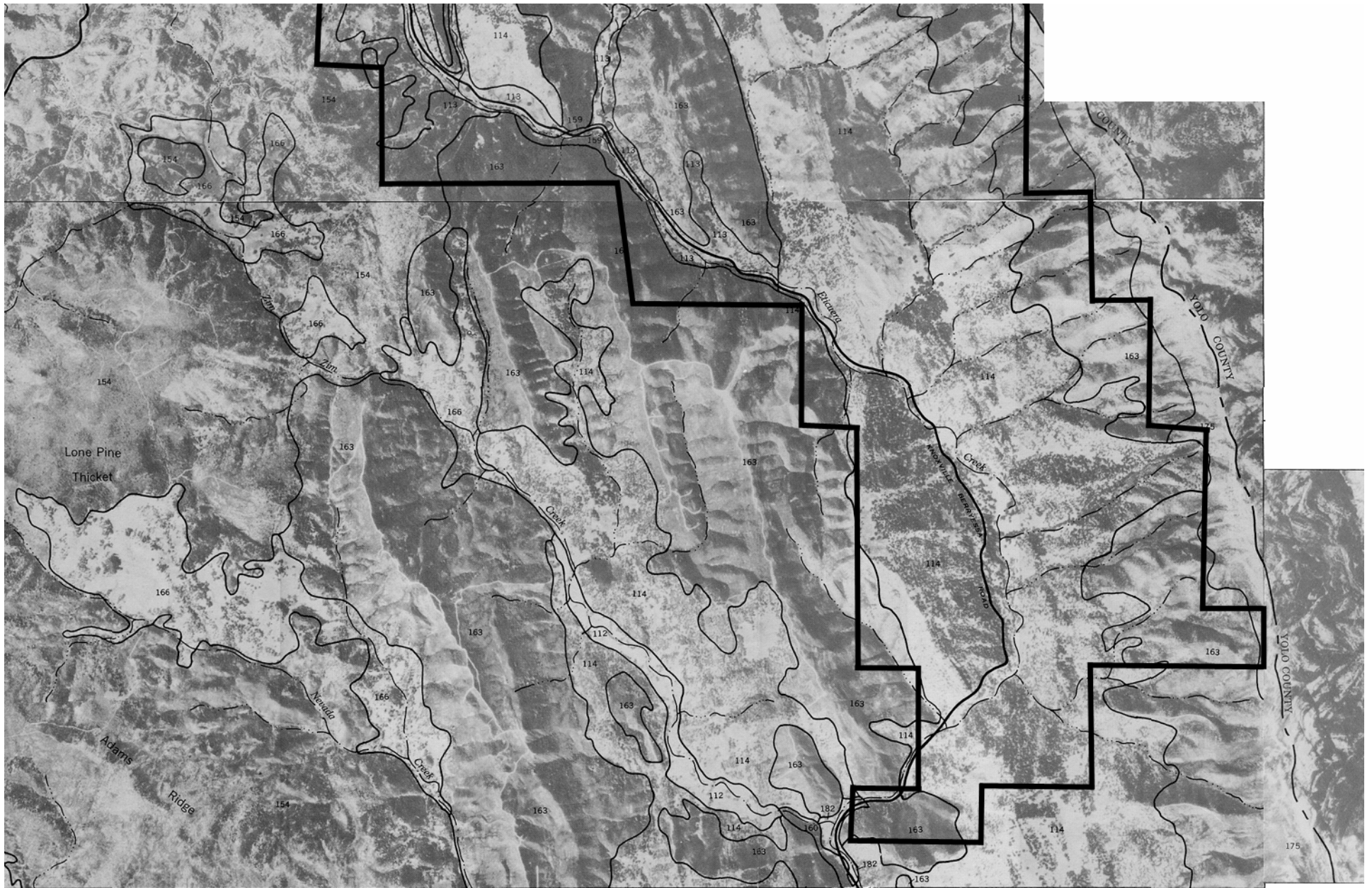
USDA Soil Conservation Service Map

Soil map of the Knoxville Wildlife Area, adapted from the Soil Survey of Napa County, by G. Lambert and J. Kashiwagi, USDA Soil Conservation Service, 1978. Map units are keyed to the table below. For series descriptions, see the text of the Knoxville Wildlife Area Management Plan and <http://www.ca.nrcs.usda.gov/mlra02/napa.html>.

Table C.1. Key to soils mapped at the Knoxville Wildlife Area

Bressa series	
112	Bressa-Dibble complex, 5 to 15 percent slopes
113	Bressa-Dibble complex, 15 to 30 percent slopes
114	Bressa-Dibble complex, 30 to 50 percent slopes
Contra Costa series	
120	Contra Costa loam, 5 to 15 percent slopes
Diablo series	
129	Diablo clay, 30 to 50 percent slopes
Henneke series	
154	Henneke gravelly loam, 30 to 75 percent slopes
Los Gatos series	
159	Los Gatos loam, 30 to 50 percent slopes
Maymen series	
163	Maymen-Millsholm-Lodo association, 30 to 75 percent slopes
Montara series	
166	Montara clay loam, 5 to 30 percent slopes
Rock outcrop	
175	Rock outcrop
Yolo series	
182	Yolo loam, 2 to 5 percent slopes





Appendix D.

License for Diversion and Use of Water



McLaughlin Mine

November 26, 2000

Mark Van Camp, Watermaster
Upper Putah Creek Watershed
2450 Alhambra Boulevard, 2nd Floor
Sacramento, CA 95817

RE: Knoxville Ranch stock ponds (1.7 acre-feet)
Application: 029482 Permit: 020500 License: 013423

Dear Mr. Van Camp,

Please be advised that ownership of the above-referenced ponds was transferred to the California Department of Fish & Game in July, 2000. As a result the water rights and reporting requirements are now the responsibility of that agency. For reference, I have attached a copy of the original license, dated June 23, 1999.

Homestake continues to hold the following water rights subject to reporting under Condition 12 of the March 10, 1995 Settlement Agreement:

Application: 028301	Permit: 019728	License: 013182
Application: 026510	Permit: 019200	License: 013183

Should you wish to contact the California Department of Fish & Game regarding this matter, I would recommend Jim Swanson. A copy of this letter is being forwarded to him for his information as well. Jim can be contacted as follows:

Jim Swanson, Wildlife Management
Department of Fish & Game, Central Coast Region
P. O. Box 47
Yountville, CA 94599
Phone (707) 944-5528

Thank you for your help in this matter. Should you have any questions or comments, please feel free to call me at 707-995-6070 ext. 274 or email me at denderlin@homestake.com.

Sincerely,

A handwritten signature in dark ink, appearing to read "Dean A. Enderlin".

Dean A. Enderlin
Senior Environmental Engineer/Geologist

Cc: Jim Swanson, Dept. of Fish & Game

Homestake Mining Co., McLaughlin Mine
26775 Morgan Valley Road
Lower Lake, CA 95457

Telephone (707) 995-6070
FAX (707) 995-6078



STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD
DIVISION OF WATER RIGHTS

License for Diversion and Use of Water

APPLICATION 29482
Page 1 of 5

PERMIT 20500

LICENSE **13423**

THIS IS TO CERTIFY, That

Homestake Mining Company
26775 Morgan Valley Road
Lower Lake, CA 95457-9411

has made proof as of September 4, 1996 (the date of inspection) to the satisfaction of the State Water Resources Control Board of a right to the use of the waters of 3 Unnamed Streams in Napa County

tributary to Eticuena Creek thence Lake Berryessa

for the purpose of Stockwatering, Wildlife Enhancement, and Fire Protection uses

under Permit 20500 of the Board and that the right to the use of this water has been perfected in accordance with the laws of California, the Regulations of the Board and the permit terms; that the priority of this right dates from May 1, 1989 and that the amount of water to which this right is entitled and hereby confirmed is limited to the amount actually beneficially used for the stated purposes and shall not exceed a total of one and seven-tenths (1.7) acre-feet per annum to be collected from October 15 of each year to May 1 of the succeeding year as follows: (1) 0.4 acre-foot per annum in Reservoir No. 1, (2) 0.6 acre-foot per annum in Reservoir No. 2, and (3) 0.7 acre-foot per annum in Reservoir No. 3.

The capacity of Reservoir No. 1 covered by this license shall not exceed 0.4 acre-foot.

The capacity of Reservoir No. 2 covered by this license shall not exceed 0.6 acre-foot.

The capacity of Reservoir No. 3 covered by this license shall not exceed 0.7 acre-foot.

After the initial filling of the reservoirs, licensee's right under this license extends only to water necessary to keep the storage reservoirs full by replacing water beneficially used and water lost by evaporation and seepage, and to refill if emptied for necessary maintenance or repair. Such right shall be exercised only during the authorized diversion season.

(0000041)

THE POINTS OF DIVERSION OF SUCH WATER ARE LOCATED:

- (1) Reservoir No. 1 - North 2,250 feet and West 2,200 feet from SE corner of Section 15, T11N, R4W, MDB&M, being within NW¼ of SE¼ of said Section 15.
- (2) Reservoir No. 2 - North 1,850 feet and West 1,050 feet from SE corner of Section 15, T11N, R4W, MDB&M, being within NE¼ of SE¼ of said Section 15, and
- (3) Reservoir No. 3 - North 350 feet and East 1,900 feet from SW corner of Section 26, T11N, R4W, MDB&M, being within SE¼ of SW¼ of said Section 26.

A DESCRIPTION OF THE LANDS OR THE PLACE WHERE SUCH WATER IS PUT TO BENEFICIAL USE IS AS FOLLOWS:

At Reservoir No. 1 within NW¼ of SE¼ of Section 15, Reservoir No. 2 within NE¼ of SE¼ of Section 15, and Reservoir No. 3 within SE¼ of SW¼ of Section 26, all within T11N, R4W, MDB&M, as shown on map on file with State Water Resources Control Board.

Licensee shall comply with the following provisions which are derived from the Condition 12 Settlement Agreement dated March 10, 1995 (Agreement) pursuant to the Sacramento County Superior Court, Judicial Council Coordination Proceeding No. 2565:

- (1) Licensee is hereby put on notice that the Sacramento County Superior Court, Judicial Council Coordination Proceeding No. 2565, has retained jurisdiction over the parties and, upon application by the watermaster, has the right to temporarily enjoin the diversion of water under this license for noncompliance with the terms of the Agreement.
- (2) Diversion of water under this license shall be subject to the watermaster appointed by the court to enforce the terms of the Agreement. The licensee shall be responsible for partial payment of the watermaster costs in accordance with the terms of the Agreement.
- (3) Licensee may employ existing methods or means of measurement (or alternatively any other standard means of measurement normally acceptable or satisfactory to the SWRCB in its administration of appropriative water rights) for determining the amount of water diverted to storage under this license, unless otherwise specified by the Agreement.
- (4) Licensee shall install at licensee's own cost such additional or other measurement devices as are necessary to measure actual depletions, if the watermaster determines that additional measures are necessary, consistent with Section 3.A.3 (Measuring Devices) of the Agreement.
- (5) Licensee shall report to the watermaster annually, on or about September 1, the amount of water diverted to storage under this license at the beginning and end of the Accumulation Season as required by the watermaster. Such annual reports shall be made in writing on forms approved by the watermaster.
- (6) Licensee shall allow the watermaster reasonable access to the project covered by this license to inspect measuring equipment and to verify compliance to terms and conditions of the Agreement, upon 48-hour prior notice and upon such reasonable conditions as licensee may prescribe.
- (7) Licensee is hereby put on notice that there may be years when diversion of water under this license will not be within the reservation of water established for the Putah Creek watershed upstream of Monticello Dam, as set forth in the Agreement and that in those years no water may be available under this license.
- (8) In the event Allowable Depletion is exceeded in any year, licensee shall release water diverted to storage to the extent necessary to bring the Allowable Depletion into compliance. Licensee's obligation to release water from storage shall be governed by the repayment provisions of the Agreement. (Agreement pp. 9, 10, and 11)
- (9) In any year in which Annual Depletion exceeds Allowable Depletion, if Lake Berryessa:
(1) does not drop below 640,000 acre-feet in storage as of May 1, licensee shall have three years, starting in the next Accumulation Season, to make up or repay licensee's excess

diversions; or (2) does not reach 640,000 acre-feet of storage as of May 1, licensee shall have one year, starting in the next Accumulation Season to make up or repay licensee's excess diversions. In the event that Lake Berryessa spills at any time prior to full payback of excess depletion, licensee shall be excused from any further obligation for repayment of the overage.

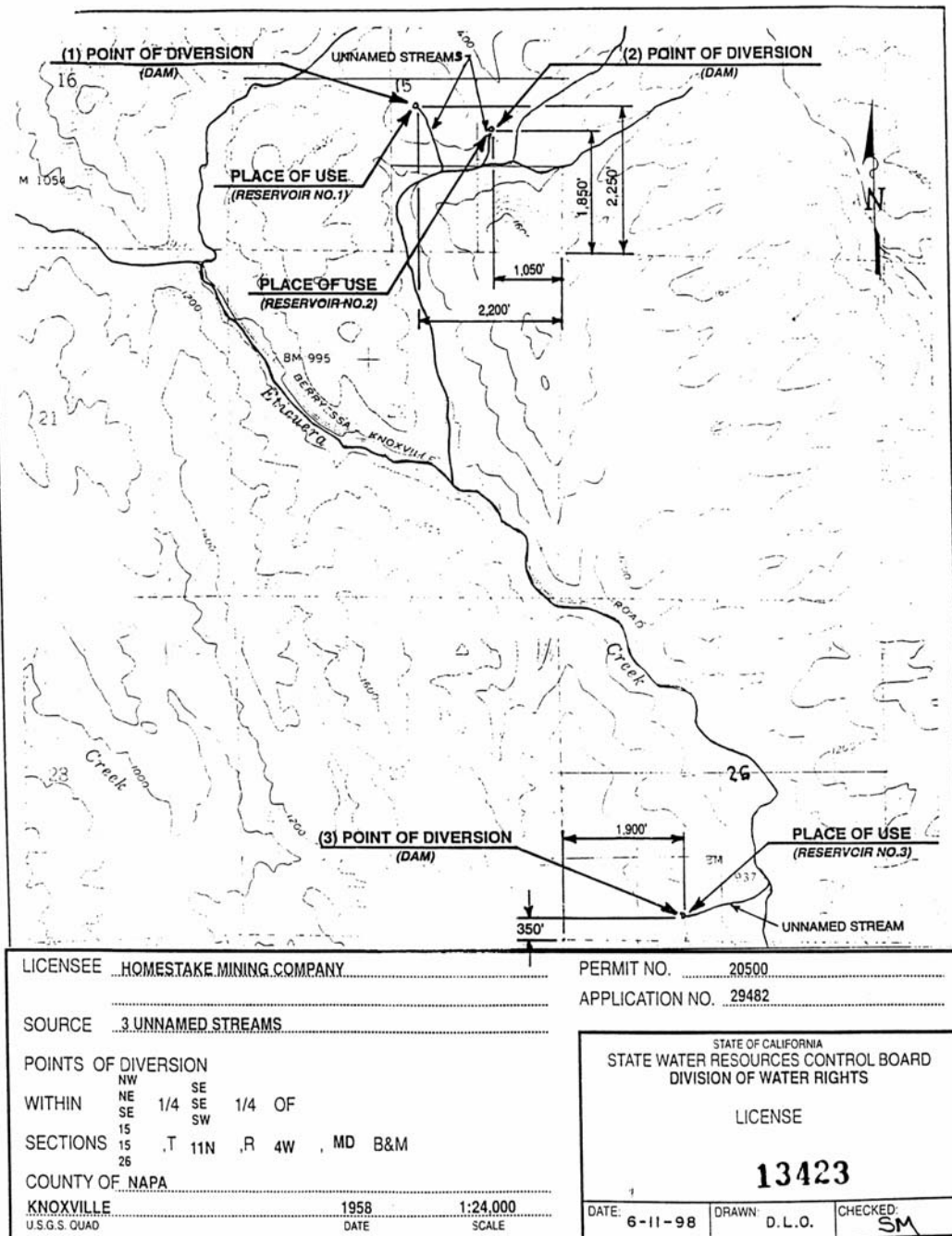
- (10) Licensee shall provide watermaster prior notice of any repayment. Repayment may be made either by releases from storage, curtailment of direct diversion, or by the provision of water from other sources.
- (11) Licensee shall notify the watermaster of any change in ownership of land, changes in the water right, or changes in address related to the license.
- (12) Licensee is hereby put on notice of licensee's right, upon reasonable prior notice, to inspect and to copy, at licensee's own expense, all records and reports of the watermaster.

Inclusion in the license of certain provisions of this Agreement shall not be construed as disapproval of other provisions of the Agreement or as affecting the enforceability, as between the parties, of such other provisions insofar as they are not inconsistent with the terms of this license.

(0000024)

The State Water Resources Control Board (SWRCB) shall have continuing authority under Article X, Section 2 of the California Constitution, Water Code Sections 100 and 275, and the common law public trust doctrine over this license to delete, revise, amend, or adopt new terms or conditions to:
(1) implement the March 10, 1995 Condition 12 Settlement Agreement and any amendments to the agreement and
(2) make the terms or conditions consistent with any order of the superior court. No action shall be taken pursuant to this paragraph unless the SWRCB provides notice to affected parties and provides an opportunity for a hearing.

(0000012)



Appendix E.

Vascular Flora of the Knoxville Wildlife Area

Appendix E. Vascular Flora of the Knoxville Wildlife Area

*denotes non-native species ?denotes species identification uncertain

Scientific Name	Common Name	MCV Vegetation Type(s) and map codes								
		Int. live oak - blue oak	Int. live oak	Mixed oak	Valley oak riparian	Blue oak	Annual grasslands	East county chaparral	Serpentine chaparral	Other
		1202	1222	1223	3101	3122	7120 7130	4301	4303 4304 4305 4306	
Ferns & Allies										
<i>Adiantum jordanii</i>	maidenhair fern	X								
<i>Aspidotis californica</i>	California lace fern							X		
<i>Aspidotis densa</i>	Indian's dream								X	
<i>Cheilanthes covillei</i>	Coville's lip fern							X		
<i>Dryopteris arguta</i>	California wood fern	X								
<i>Equisetum laevigatum</i>	Braun's scouring rush				X					
<i>Pentagramma triangularis</i>	goldenback fern							X		
<i>Pellaea andromedefolia</i>	coffee fern					X				
<i>Pellaea mucronata</i>	bird's foot fern							X		
Conifers										
<i>Cupressus macnabiana</i>	McNab cypress							X		
<i>Pinus sabiniana</i>	gray pine	X	X			X				
Dicots										
ANACARDIACEAE										
<i>Rhus trilobata</i>	squaw bush				X					
<i>Toxicodendron diversilobum</i>	poison oak		X		X			X		
APIACEAE										
<i>Angelica californica</i>	California angelica							X		
<i>Angelica tomentosa</i>	coast range angelica				X					
<i>Daucus carota</i> *	Queen Anne's lace						X			
<i>Daucus pusillus</i>	rattlesnake weed							X		

Appendix E. Vascular Flora of the Knoxville Wildlife Area

*denotes non-native species ?denotes species identification uncertain

Scientific Name	Common name	Int. live oak - blue oak	Int. live oak	Mixed oak	Valley oak riparian	Blue oak	Annual grasslands	East county chaparral	Ser-pentine chaparral	Other
<i>Lomatium californicum</i>	California lomatium					X				
<i>Lomatium dasycarpum</i> var. <i>dasycarpum</i>	woolly-fruited lomatium								X	
<i>Lomatium hooveri</i>	Hoover's lomatium						X			X
<i>Lomatium macrocarpum</i>	large-fruited lomatium							X		
<i>Lomatium marginatum</i> var. <i>purpureum</i>	Hartweg's lomatium								X	
<i>Lomatium utriculatum</i>	foothill lomatium					X				
<i>Perideridia kelloggii</i>	Kellogg's yampah									X
<i>Sanicula bipinnata</i>	poison sanicle					X				
<i>Sanicula bipinnatifida</i>	purple sanicle					X				
<i>Sanicula crassicaulis</i>	Pacific snakeroot					X				
<i>Sanicula tuberosa</i>	tuberous sanicle							X		
<i>Scandix pecten-veneris</i> *	Spanish needles						X			
<i>Torilis arvensis</i> *	common hedge parsley					X?				
<i>Torilis nodosa</i> *	notted hedge parsley					X?				
APOCYNACEAE										
<i>Apocynum cannabinum</i>	Indian hemp				X					
ASCLEPIADACEAE										
<i>Asclepias eriocarpa</i>	kotolo				X	X				
<i>Asclepias fascicularis</i>	narrow-leaved milkweed				X					
ASTERACEAE										
<i>Achillea millefolium</i>	common yarrow		X					X		
<i>Achyraea mollis</i>	blow wives						X			
<i>Agoseris grandiflora</i>	large-flowered agoseris							X		
<i>Agoseris heterophylla</i>	ann. mountain dandelion								X	
<i>Ancistrocarphus filagineus</i>	wolly fish-hooks							X		
<i>Anthemis cotula</i> *	mayweed							X		
<i>Artemisia douglasiana</i>	Douglas' mugwort				X					
<i>Aster radulinus</i>	rough aster							X		

Appendix E. Vascular Flora of the Knoxville Wildlife Area

*denotes non-native species ?denotes species identification uncertain

Scientific Name	Common name	Int. live oak - blue oak	Int. live oak	Mixed oak	Valley oak riparian	Blue oak	Annual grasslands	East county chaparral	Ser-pentine chaparral	Other
<i>Baccharis salicifolia</i>	mule fat				X					
<i>Brickellia californica</i>	California brickellia				X					
<i>Calycadenia pauciflora</i>	few-flowered calycadenia								X	
<i>Carduus pycnocephalus</i> *	Italian thistle					X				
<i>Centaurea melitensis</i> *	Malto starthistle							X ?		
<i>Centaurea solstitialis</i> *	yellow starthistle					X				
<i>Chaenactis glabriuscula</i> var. <i>heterocarpha</i>	slender chaenactis							X		
<i>Chamomilla suaveolens</i> *	pineapple weed						X			
<i>Cichorium intybus</i> *	chicory						X			
<i>Cirsium cymosum</i>	peregrine thistle							X		
<i>Cirsium douglasii</i> var. <i>breweri</i>	Indian thistle							X		
<i>Cirsium occidentale</i> var. <i>venustum</i>	red thistle							X		
<i>Cirsium vulgare</i> *	bull thistle				X					
<i>Erigeron</i> sp.	rock daisy							X ?		
<i>Eriophyllum lanatum</i> var. <i>achillaeoides</i>	woolly sunflower							X		
<i>Filago californica</i>	California filago							X		
<i>Filago gallica</i>	narrow-leaved filago						X			
<i>Gnaphalium californicum</i>	California cudweed				X					
<i>Gnaphalium stramineum</i>	cotton batting plant				X					
<i>Grindelia camporum</i> var. <i>camporum</i>	great valley gumplant						X ?			
<i>Helenium bigelovii</i>	Bigelow's sneezeweed								X	
<i>Helenium puberulum</i>	common sneezeweed					X				
<i>Helianthella californica</i>	California helianthella							X		
<i>Helianthus bolanderi</i>	Bolander's sunflower							X		
<i>Helianthus gracilentus</i>	slender sunflower								X	
<i>Hemizonia congesta</i> ssp. <i>luzulifolia</i>	hayfield tarweed									X
<i>Hesperervax sparsiflora</i>	erect hesperervax							X		
<i>Holocarpha virgata</i> ssp. <i>virgata</i>	virgate tarweed						X			
<i>Hypochaeris glabra</i> *	smooth cat's ear					X				
<i>Hypochaeris radicata</i> *	hairy cat's ear					X				
<i>Lactuca serriola</i> *	prickly lettuce	X								

Appendix E. Vascular Flora of the Knoxville Wildlife Area

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Scientific Name	Common name	Int. live oak - blue oak	Int. live oak	Mixed oak	Valley oak riparian	Blue oak	Annual grasslands	East county chaparral	Ser-pentine chaparral	Other
<i>Lagophylla ramosissima</i> ssp. <i>congesta</i>	common hareleaf		X							
<i>Lagophylla minor</i>	lesser hareleaf								X	
<i>Lasthenia californica</i>	California goldfields							X		
<i>Layia chrysanthemoides</i>	smooth layia						X			
<i>Lessingia ramulosa</i>	Sonoma lessingia								X	
<i>Madia exigua</i>	small tarweed							X		
<i>Madia gracilis</i>	slender tarweed					X ?		X ?		
<i>Malacothrix floccifera</i>	woolly malacothrix	X?								
<i>Micropus californicus</i> var. <i>californicus</i>	slender cottonweed								X	
<i>Microseris douglasii</i> ssp. <i>douglasii</i>	Douglas' microseris					X				
<i>Microseris sylvatica</i>	sylvan microseris						X			
<i>Senecio aronicoides</i>	California butterweed						X			
<i>Senecio clevelandii</i> var. <i>clevelandii</i>	Cleveland's butterweed								X	
<i>Senecio vulgaris</i> *	common groundsel							X		X
<i>Solidago californica</i>	California goldenrod							X		
<i>Taraxacum officinale</i> *	common dandelion							X		
<i>Uropappus lindleyi</i>	silver puffs							X		
<i>Xanthium strumarium</i>	cocklebur							X		
<i>Wyethia angustifolia</i>	narrow-leaved mule ears						X			
<i>Wyethia helenoides</i>	gray mule-ears		X							
BORAGINACEAE										
<i>Amsinckia menziesii</i> ssp. <i>intermedia</i>	common fiddleneck						X			
<i>Amsinckia menziesii</i> ssp. <i>menziesii</i>	common fiddleneck					X				
<i>Cryptantha flaccida</i>	flaccid cryptantha							X		
<i>Cryptantha hispidula</i>	Napa cryptantha							X		
<i>Cryptantha microstachys</i> ?	Tejon cryptantha							X		
<i>Cynoglossum grande</i>	grand hound's tongue							X		
<i>Heliotropium curassavicum</i>	seaside heliotrope		X							
<i>Pectocarya pusilla</i>	dwarf pectocarya					X				
<i>Plagiobothrys bracteatus</i> ?	bracted popcornflower									X
<i>Plagiobothrys fulvus</i>	fulvous popcornflower									X

Appendix E. Vascular Flora of the Knoxville Wildlife Area

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Scientific Name	Common name	Int. live oak - blue oak	Int. live oak	Mixed oak	Valley oak riparian	Blue oak	Annual grasslands	East county chaparral	Ser-pentine chaparral	Other
<i>Plagiobothrys nothofulvus</i>	rusty popcornflower				X					
<i>Plagiobothrys tenellus</i>	slender popcornflower							X		
BRASSICACEAE										
<i>Arabis modesta</i>	modest rock cress							X		
<i>Athysanus pusillus</i>	dwarf athysanus						X?			
<i>Brassica nigra</i> *	black mustard						X			
<i>Cardamine californica</i> var. <i>sinuata</i>	California milkmaids							X		
<i>Hirshfeldia incana</i>	Mediterranean mustard						X			
<i>Lepidium latifolium</i> *	Perennial pepperweed				X					
<i>Lepidium strictum</i>	wayside peppergrass						X			
<i>Raphanus sativus</i> *	wild radish						X			
<i>Sisymbrium officinale</i> *	hedge mustard						X			
<i>Streptanthus breweri</i> ssp. <i>breweri</i>	Brewer's jewelflower								X	
<i>Streptanthus breweri</i> ssp. <i>hesperidis</i>	green jewelflower								X	
<i>Streptanthus glandulosus</i> ssp. <i>glandulosus</i>	common jewelflower							X		
<i>Thlaspi arvense</i> *							X?			
<i>Thysanocarpus curvipes</i>	lace pod				X			X		
CALLITRICHACEAE										
<i>Callitriche marginata</i>	California water starwort					X				
CALYCANTHACEAE										
<i>Calycanthus occidentalis</i>	spice bush				X					
CAPRIFOLIACEAE										
<i>Lonicera interrupta</i>	chaparral honeysuckle							X		
<i>Sambucus mexicana</i>	blue elderberry				X					
<i>Symphoricarpos albus</i> var. <i>laevigatus</i>	common snowberry				X					

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Scientific Name	Common name	Int. live oak - blue oak	Int. live oak	Mixed oak	Valley oak riparian	Blue oak	Annual grasslands	East county chaparral	Serpentine chaparral	Other
CARYOPHYLLACEAE										
<i>Cerastium glomeratum</i>	mouse-ear chickweed *				X					
<i>Petrorhagia prolifera</i>	wild carnation *					X?				
<i>Spergularia rubra</i>	purple sand spurry *						X			
<i>Stellaria media</i>	common chickweed *				X					
<i>Stellaria nitens</i>	shiny chickweed							X		
CISTACEAE										
<i>Helianthemum scoparium</i>	common rush rose							X		
CONVOLVULACEAE										
<i>Calystegia collina ssp. collina</i>	serpentine morning-glory							X		
<i>Calystegia o. ssp. occidentalis</i>	western morning-glory		X							
<i>Calystegia subacaulis</i> ?	hill morning-glory							X		
<i>Convolvulus arvensis</i>	field bindweed *						X			
CORNACEAE										
<i>Cornus glabrata</i>	brown dogwood				X					
CRASSULACEAE										
<i>Dudleya cymosa</i>	Dudley's live-forever							X		
CUCURBITACEAE										
<i>Marah fabaceus</i>	California manroot				X					
<i>Marah watsonii</i>	taw manroot		X		X					
CUSCUTACEAE										
<i>Cuscuta</i> sp.	dodder								X	
DATISCAEAE										
<i>Datisca glomerata</i>	durango root				X	X				

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Scientific Name	Common name	Int. live oak - blue oak	Int. live oak	Mixed oak	Valley oak riparian	Blue oak	Annual grasslands	East county chaparral	Serpentine chaparral	Other
ERICACEAE										
<i>Arbutus menziesii</i>	madrone	X?								
<i>Arctostaphylos manzanita</i>	common manzanita							X		
<i>Arctostaphylos viscida</i> ssp. <i>pulchella</i>	white-leaf manzanita								X	
EUPHORBIACEAE										
<i>Chamaesyce</i> s. ssp. <i>serpyllifolia</i>	thyme-leaved spurge				X?					
<i>Eremocarpus setigeris</i>	turkey mullein				X?	X				
<i>Euphorbia crenulata</i>	Chinese caps								X	
<i>Euphorbia spathulata</i>	reticulate-seeded spurge							X?		
FABACEAE										
<i>Astragalus clevelandii</i>	Cleveland's milkvetch									X
<i>Astragalus gambelianus</i>	Gambel's dwarf locoweed							X		
<i>Cercis occidentalis</i>	western redbud							X		
<i>Glycyrrhiza lepidota</i>	American licorice				X					
<i>Hoita macrostachya</i>	leather root				X					X
<i>Lathyrus vesititus</i> var. <i>vestitus</i>	hillside pea		X			X				
<i>Lotus corniculatus</i> *	bird's foot trefoil				X					
<i>Lotus grandiflorus</i> var. <i>grandiflorus</i>	grand lotus							X		
<i>Lotus purshianus</i> var. <i>purshianus</i>	Spanish trefoil				X?					
<i>Lotus scoparius</i> var. <i>scoparius</i>	common deerweed							X		
<i>Lotus wrangelianus</i>	Chilean trefoil							X?		
<i>Lupinus albifrons</i> ssp. <i>albifrons</i>	silver lupine		X							
<i>Lupinus bicolor</i>	miniature lupine					X				
<i>Lupinus microcarpus</i> ssp. <i>aureus</i>	gold-whorl lupine						X			
<i>Lupinus microcarpus</i> ssp. <i>densiflorus</i>	white-whorl lupine								X	
<i>Lupinus formosus</i> var. <i>formosus</i>	summer lupine						X			
<i>Lupinus latifolius</i> var. <i>latifolius</i>	broad-leaf lupine		X							
<i>Lupinus nanus</i>	Douglas's lupine							X		
<i>Lupinus succulentus</i>	arroyo lupine						X			
<i>Medicago Arabica</i> *	spotted medic					X				
<i>Medicago polymerha</i> *	bur clover						X			

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Scientific Name	Common name	Int. live oak - blue oak	Int. live oak	Mixed oak	Valley oak riparian	Blue oak	Annual grasslands	East county chaparral	Ser-pentine chaparral	Other
<i>Medicago sativa</i> *	alfalfa					X				
<i>Melilotus albus</i> *	white sweet clover				X					
<i>Melilotus indicus</i> *	yellow sweet clover				X					
<i>Robinia pseudo-acacia</i> *	black locust				X					
<i>Thermopsis m. var. macrophylla</i>	false lupine						X	X		
<i>Trifolium albopurpureum</i> var. <i>albopurpureum</i>	common Indian clover							X		
<i>Trifolium bifidum</i> var. <i>bifidum</i>	notch-leaved clover					X?				
<i>Trifolium bifidum</i> var. <i>decipiens</i>	notch-leaved clover					X				
<i>Trifolium ciliolatum</i>	tree clover					X?				
<i>Trifolium depauperatum</i> var. <i>amplectans</i>	pale sack clover						X			
<i>Trifolium dubium</i> *	shamrock						X			
<i>Trifolium fragiferum</i> *	strawberry clover				X					
<i>Trifolium fucatum</i>	bull clover									X
<i>Trifolium hirtum</i> *	rose clover					X				
<i>Trifolium microcephalum</i>	maiden clover							X		
<i>Trifolium microdon</i>	thimble clover					X				
<i>Trifolium obtusiflorum</i>	creek clover									X
<i>Trifolium subterraneum</i> *	sub clover						X			
<i>Trifolium wilsonii</i>	tomcat clover							X		
<i>Vicia Americana</i>	American vetch				X	X				
<i>Vicia sativa</i> var. <i>nigra</i> *	common vetch					X				
<i>Vicia sativa</i> var. <i>sativa</i> *	spring vetch									
<i>Vicia villosa</i> var. <i>varia</i> *	woolly-podded vetch						X			
FAGACEAE										
<i>Quercus agrifolia</i> var. <i>agrifolia</i>	coast live oak	X	X		X					
<i>Quercus berberidifolia</i>	scrub oak	X						X		
<i>Quercus douglasii</i>	blue oak	X			X	X				
<i>Quercus durata</i>	leather oak								X	
<i>Quercus lobata</i>	valley oak				X					
<i>Quercus wislizenii</i> var. <i>wislizenii</i>	interior live oak	X	X		X					

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Scientific Name	Common name	Int. live oak - blue oak	Int. live oak	Mixed oak	Valley oak riparian	Blue oak	Annual grasslands	East county chaparral	Ser-pentine chaparral	Other
<i>Quercus kelloggii</i> X <i>wislizenii</i>	oracle oak				X					
<i>Quercus berberidifolia</i> X <i>douglasii</i> ?		X								
GARRYACEAE										
<i>Garrya congdonii</i>	Congdon's silk tassel								X	
GENTIANACEAE										
<i>Centaurium muehlenbergii</i>	canchalagua				X					
<i>Centaurium trichanthum</i>	alkali centaury								X	
GERANIACEAE										
<i>Erodium botrys</i> *	long-beaked filaree					X		X		
<i>Erodium brachycarpum</i> *	obtuse filaree							X		
<i>Erodium cicutarium</i> *	redstem filaree					X		X		
<i>Erodium moschatum</i> *	whitestem filaree	X?								
<i>Geranium dissectum</i> *	cut-leaf geranium					X				
<i>Geranium molle</i> *	dove's foot geranium	X				X				
GROSSULARIACEAE										
<i>Ribes malvaceum</i> var. <i>malvaceum</i>	chaparral currant							X		
HIPPOCASTANACEAE										
<i>Aesculus californicus</i>	buckeye	X	X		X			X		
HYDROPHYLLACEAE										
<i>Eriodictyon californicum</i>	yerba santa							X		
<i>Nemophila heterophylla</i>	woodland nemophila		X							
<i>Nemophila menziesii</i> var. <i>menziesii</i>	baby blue-eyes						X			
<i>Nemophila pedunculata</i>	meadow nemophila							X		
<i>Phacelia imbricata</i> ssp. <i>imbricata</i>	imbricate phacelia		X							

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Scientific Name	Common name	Int. live oak - blue oak	Int. live oak	Mixed oak	Valley oak riparian	Blue oak	Annual grasslands	East county chaparral	Ser-pentine chaparral	Other
HYPERICACEAE										
<i>Hypericum concinnum</i>	gold wire							X		
LAMIACEAE										
<i>Lamium amplexicaule</i> *	henbit						X			
<i>Lepechinia calycina</i>	pitcher sage							X		
<i>Marrubium vulgare</i> *	horehound						X			
<i>Monardella villosa</i> var. <i>villosa</i>	coyote mint		X							
<i>Monardella villosa</i> var. ?				X						
<i>Monardella viridis</i> var. <i>viridis</i>	green coyote mint							X		
<i>Salvia columbariae</i>	chia							X		
<i>Scutellaria siphocampyloides</i>	Austin's skullcap				X				X	
<i>Scutellaria tuberosa</i>	Danie's skullcap	X						X		
<i>Stachys ajugoides</i> var. <i>rigida</i>	rigid hedge nettle				X					
<i>Stachys albens</i>	woolly hedge nettle				X					
<i>Stachys stricta</i>	Sonoma hedge nettle				X					
<i>Trichostema laxum</i>	turpentine weed				X				X	
LAURACEAE										
<i>Umbellularia californica</i>	California bay	X	X		X			X		
LIMNANTHACEAE										
<i>Limnanthes douglasii</i> var. <i>nivea</i>	Douglas's meadowfoam						X			
LINACEAE										
<i>Hesperolinon disjunctum</i>	disjunct dwarf flax								X	
LYTHRACEAE										
<i>Lythrum hyssopifolia</i> *	hyssop-leaved loosestrife									
MALVACEAE										
<i>Malacothamnus helleri</i>	Heller's bush mallow	X						X	X	
<i>Malva parviflora</i> *	cheese-weed						X			

Appendix E. Vascular Flora of the Knoxville Wildlife Area

*denotes non-native species ?denotes species identification uncertain

Scientific Name	Common name	Int. live oak - blue oak	Int. live oak	Mixed oak	Valley oak riparian	Blue oak	Annual grasslands	East county chaparral	Serpentine chaparral	Other
<i>Sidalcea diploscypha</i>	fringed checkermallow									X
<i>Sidalcea hartwegii</i>	Hartweg's checkermallow							X		
<i>Sidalcea</i> sp.								X		
OLEACEAE										
<i>Fraxinus dipetala</i>	flowering ash				X			X		
<i>Fraxinus latifolia</i>	Oregon Ash				X					
ONAGRACEAE										
<i>Clarkia concinna</i>	red ribbons								X	
<i>Clarkia purpurea</i> var. <i>quadrivulnera</i>	wine-cup clarkia					X				
<i>Clarkia unguiculata</i>	elegant clarkia	X								
<i>Epilobium brachycarpum</i>	panicked willow herb						X			
<i>Epilobium ciliatum</i> ssp. <i>ciliatum</i>	northern willow herb				X					
<i>Epilobium minutum</i>	minute willow herb								X	
<i>Zauschneria californica</i>	California fuchsia					X				
OROBANCHACEAE										
<i>Orobanche uniflora</i>	naked broomrape	X								
PAPAVERACEAE										
<i>Dicentra chrysantha</i>	golden ears drops							X		
<i>Eschscholzia californica</i>	California poppy						X			
<i>Eschscholzia caespitosa</i>	tufted poppy							X		
PLANTAGINACEAE										
<i>Plantago erecta</i>	dwarf plantain					X				
<i>Plantago truncate</i> * ?						X				
POLEMONIACEAE										
<i>Allophyllum gilioides</i>	straggling gilia							X		
<i>Collomia diversifolia</i>	serpentine collomia								X	
<i>Gilia achillaeifolia</i> ssp. <i>multicaulis</i>	California gilia					X				

Appendix E. Vascular Flora of the Knoxville Wildlife Area

*denotes non-native species ?denotes species identification uncertain

Scientific Name	Common name	Int. live oak - blue oak	Int. live oak	Mixed oak	Valley oak riparian	Blue oak	Annual grass- lands	East county chap- arral	Ser- pentine chap- arral	Other
<i>Gilia clivorum</i> ?	many-stemmed gilia					X				
<i>Gilia tricolor</i>	bird's eye gilia					X?				
<i>Linanthus androsaceus</i>	showy linanthus					X				
<i>Linanthus bicolor</i>	baby stars						X			
<i>Linanthus bolanderi</i>	Baker's linanthus							X		
<i>Linanthus dichotomus</i>	evening snow							X		
<i>Linanthus parviflorus</i>	common linanthus							X		
<i>Linanthus pygmaeus</i> ssp. <i>continentalis</i>	pygmy linanthus							X		
<i>Navarretia jepsonii</i>	Jepson's navarretia					X				
<i>Navarretia mellita</i>	honey-scented navarretia				X					
<i>Navarretia pubescens</i>	downy navarretia					X		X		
<i>Phlox gracilis</i>	slender phlox							X		
POLYGONACEAE										
<i>Eriogonum luteolum</i> var. <i>luteolum</i>	wicker buckwheat							X		
<i>Eriogonum nudum</i> var. <i>nudum</i>	nudestem buckwheat							X		
<i>Eriogonum umbellatum</i> var. <i>furcosum</i> ?	sulphur buckwheat							X		
<i>Pterostegia drymarioides</i>	valentine plant							X		
<i>Rumex crispus</i> *	curly dock ?				X					
PORTULACACEAE										
<i>Calandrinia ciliata</i>	red maids					X				
<i>Claytonia exigua</i> ssp. <i>exigua</i>	dwarf miner's lettuce							X		
<i>Claytonia parviflora</i> ssp. <i>parviflora</i>	small miner's lettuce							X		
<i>Claytonia perfoliata</i> ssp. <i>perfoliata</i>	common miner's lettuce				X	X				
<i>Lewisia rediviva</i>	bitterroot							X		
<i>Montia fontana</i>	water montia				X?					
PRIMULACEAE										
<i>Anagallis arvensis</i> *	scarlet pimpernel				X?					
<i>Dodecatheon hendersonii</i>	Henderson's shooting star							X		

Appendix E. Vascular Flora of the Knoxville Wildlife Area

*denotes non-native species ?denotes species identification uncertain

Scientific Name	Common name	Int. live oak - blue oak	Int. live oak	Mixed oak	Valley oak riparian	Blue oak	Annual grasslands	East county chaparral	Serpentine chaparral	Other
RANUNCULACEAE										
<i>Aquilegia eximia</i>	Van Houte's columbine								X	
<i>Clematis lasiantha</i>	chaparral virgin's bower		X					X		
<i>Clematis ligusticifolia</i>	western virgin's bower				X					
<i>Delphinium c. var. californicum</i> ?	California larkspur							X		
<i>Delphinium hesperium</i> ssp. <i>pallescens</i>	pale western larkspur						X			
<i>Delphinium nudicaule</i>	red larkspur					X				
<i>Delphinium patens</i> ssp. <i>patens</i>	Indian blue larkspur		X ?							
<i>Delphinium uliginosum</i>	swamp larkspur				X			X		
<i>Delphinium variegatum</i>	royal larkspur					X				
<i>Ranunculus aquatilis</i> var. <i>capillaceus</i>	water buttercup									X
<i>Ranunculus occidentalis</i>	western buttercup					X				
<i>Ranunculus hebecarpus</i>	hairy-fruited buttercup				X					
<i>Ranunculus muricatus</i> *	prickly buttercup					X				
RHAMNACEAE										
<i>Ceanothus cuneatus</i> var. <i>cuneatus</i>	buckbrush							X		
<i>Ceanothus jepsonii</i> var. <i>albiflorus</i>	white-flowered musk brush							X		
<i>Ceanothus oliganthus</i> var. <i>sorediatus</i>	Jim-brush				X			X		
<i>Rhamnus californica</i>	California coffeeberry				X					
<i>Rhamnus illicifolia</i>	holly-leaved redberry				X					
<i>Rhamnus tomentella</i> ssp. <i>tomentella</i>	serpentine coffeeberry			X	X			X		
ROSACEAE										
<i>Adenostoma fasciculatum</i>	chamise							X	X	
<i>Cercocarpus betuloides</i> var. <i>betuloides</i>	mountain mahogany		X					X		
<i>Heteromeles arbutifolia</i>	toyon	X						X		
<i>Horkelia californica</i> ssp. <i>dissita</i>	tall horkelia									X
<i>Oemleria cerasiformis</i>	oso berry	X								
<i>Potentilla glandulosa</i> ssp. <i>glandulosa</i>	sticky cinquefoil				X					

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Scientific Name	Common name	Int. live oak - blue oak	Int. live oak	Mixed oak	Valley oak riparian	Blue oak	Annual grasslands	East county chaparral	Serpentine chaparral	Other
<i>Prunus subcordata</i>	Sierra plum				X					
<i>Rosa californica</i>	California rose				X					
<i>Rubus ursinus</i>	California blackberry				X					
RUBIACEAE										
<i>Galium andrewsii</i> ssp. <i>andrewsii</i>	phlox-leaved bedstraw							X	X	
<i>Galium aparine</i>	cleavers							X		
<i>Galium bolanderi</i>	Bolander's bedstraw							X		
<i>Galium porrigens</i> var. <i>tenu</i>	climbing bedstraw					X				
<i>Sherardia arvensis</i> *	field madder					X				
SALICACEAE										
<i>Populus fremontii</i> ssp. <i>fremontii</i>	Fremont cottonwood				X					
<i>Salix breweri</i>	Brewer's willow				X					
<i>Salix exigua</i>	sandbar willow				X					
<i>Salix laevigata</i>	red willow				X					
<i>Salix lasiolepis</i>	arroyo willow				X					
SAXIFRAGACEAE										
<i>Lithophragma affine</i>	woodland star				X					
<i>Lithophragma heterophyllum</i>	hill star				X					
<i>Saxifraga californica</i>	California saxifrage				X			X		
SCROPHULARIACEAE										
<i>Antirrhinum cornutum</i>	spurred snapdragon									X
<i>Antirrhinum</i> v. var. <i>vexillo-calyculatum</i>	wirey snapdragon				X			X		
<i>Bellardia trixago</i> *	bellardia					X				
<i>Castilleja affinis</i> ssp. <i>affinis</i>	coast paintbrush	X?								
<i>Castilleja applegatei</i> ssp. <i>martinii</i>	round-lobed Indian paintbr.							X		
<i>Castilleja attenuata</i>	valley tassels							X		

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Scientific Name	Common name	Int. live oak - blue oak	Int. live oak	Mixed oak	Valley oak riparian	Blue oak	Annual grasslands	East county chaparral	Serpentine chaparral	Other
<i>Castilleja foliolosa</i>	felt paintbrush							X		
<i>Castilleja spiralis</i>	serpentine Indian paintbr.									X
<i>Collinsia greenei</i>	Greene's blue-eyed Mary									X
<i>Collinsia heterophylla</i>	Chinese houses			X						
<i>Collinsia sparsiflora</i> var. <i>collina</i>	tiny blue-eyed Mary	X?								
<i>Collinsia sparsiflora</i> var. <i>sparsiflora</i>	blue-eyed Mary							X		
<i>Keckiella breviflorus</i> var. <i>glabrisepalus</i>	gaping keckiella		X							
<i>Keckiella lemmonii</i>	bush beard tongue				X					
<i>Mimulus aurantiacus</i>	sticky monkeyflower				X			X		
<i>Mimulus cardinalis</i>	scarlet monkeyflower				X					
<i>Mimulus douglasii</i>	Douglas's monkeyflower							X		
<i>Mimulus guttatus</i>	seep-spring monkeyflower				X					
<i>Mimulus kelloggii</i>	Kellogg's monkeyflower							X		
<i>Mimulus nudatus</i>	bare monkeyflower							X		
<i>Pedicularis densiflora</i>	Indian warrior		X							
<i>Penstemon h.</i> var. <i>heterophyllus</i>	foothill penstemon								X	
<i>Scrophularia californica</i> ssp. <i>californica</i>	California figwort				X					
<i>Triphysaria eriantha</i>	butter and eggs						X			
<i>Triphysaria pusilla</i>	dwarf owl clover					X				
<i>Triphysaria versicolor</i> var. <i>faucibarbata</i>	smooth owl clover					X				
SIMAROUBACEAE										
<i>Ailanthus altissima</i> *	tree-of-heaven				X					
SOLANACEAE										
<i>Nicotiana quadrivalvis</i>	Indian tobacco				X					
<i>Solanum parishii</i>	Parish's nightshade							X		
STERCULIACEAE										
<i>Fremontodendron c.</i> ssp. <i>californicum</i>	flannel bush							X		

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Scientific Name	Common name	Int. live oak - blue oak	Int. live oak	Mixed oak	Valley oak riparian	Blue oak	Annual grasslands	East county chaparral	Serpentine chaparral	Other
TAMARICACEAE										
<i>Tamarix parviflora</i> *	small-flowered tamarisk				X					
VALERIANACEAE										
<i>Plectritis ciliosa</i> ssp. <i>ciliosa</i>	long-spurred plectritis							X		
<i>Plectritis congesta</i>	pink plectritis					X?				
<i>Plectritis macrocera</i>	white plectritis							X		
VERBENACEAE										
<i>Phyla nodiflora</i> var. <i>rosea</i> *	garden lippia				X					
<i>Verbena lasiostachys</i> var. ?	western verbena								X	
VIOLACEAE										
<i>Viola douglasii</i>	Douglas's violet								X	
VISCACEAE										
<i>Arceuthobium occidentale</i>	western dwarf mistletoe		X							
<i>Phoradendron villosum</i>	hairy mistletoe					X				
VITACEAE										
<i>Vitis californica</i>	California grape				X					
<i>Vitis vinifera</i> *	wine grape				X					
Monocots										
CYPERACEAE										
<i>Carex barbarae</i>	Santa Barbara sedge				X					
<i>Carex serratodens</i>	serpentine sedge									X
<i>Eleocharis macrostachya</i>	pale spikerush					X				
<i>Scirpus pungens</i>	three-square				X					X

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Scientific Name	Common name	Int. live oak - blue oak	Int. live oak	Mixed oak	Valley oak riparian	Blue oak	Annual grasslands	East county chaparral	Ser-pentine chaparral	Other
IRIDACEAE										
<i>Iris macrosiphon</i>	bowl-tubed iris							X		
<i>Sisyrinchium bellum</i>	blue-eyed grass					X				
JUNCACEAE										
<i>Juncus bufonius</i> ssp. <i>bufonius</i>	toad rush						X			
<i>Juncus mexicanus</i>	Mexican rush				X					X
<i>Juncus oxymeris</i>	pointed rush									X
<i>Juncus patens</i>	spreading rush				X					
<i>Juncus tenuis</i>	slender rush						X			
<i>Juncus xiphioides</i>	iris-leaved rush				X					
LILIACEAE										
<i>Allium amplexans</i>	narrow-leaved onion								X	
<i>Allium falcifolium</i>	sickle-leaved onion								X	
<i>Allium fimbriatum</i> var. <i>fimbriatum</i>	fringed onion								X	
<i>Allium fimbriatum</i> var. <i>purdyi</i>	Purdy's onion								X	
<i>Allium serra</i>	serrated onion					X				
<i>Brodiaea elegans</i> ssp. <i>elegans</i>	harvest brodiaea						X			
<i>Calochortus amabilis</i>	Diogenes' lantern							X		
<i>Calochortus superbus</i> ?	superb mariposa tulip	X?								
<i>Chlorogalum pomeridianum</i> ssp. <i>pomeridianum</i>	wavy-leafed soap plant							X		
<i>Dichelostemma capitatum</i>	blue dicks					X	X			
<i>Dichelostemma volubile</i>	twining brodiaea								X	
<i>Fritillaria affinis</i> var. <i>affinis</i>	checker lily							X		
<i>Fritillaria pluriflora</i>	adobe lily									X
<i>Fritillaria purdyi</i>	Purdy's fritillary								X	
<i>Triteleia laxa</i>	Ithuriel's spear						X			
<i>Triteleia peduncularis</i>	long-rayed triteleia									X
<i>Zigadenus fremontii</i>	Fremont's star lily		X		X			X		
<i>Zigadenus micranthus</i> var. <i>fontanus</i>	marsh zigadenus									X

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Scientific Name	Common name	Int. live oak - blue oak	Int. live oak	Mixed oak	Valley oak riparian	Blue oak	Annual grass-lands	East county chaparral	Serpentine chaparral	Other
ORCHIDACEAE										
<i>Epipactis gigantea</i>	stream orchid									X
<i>Piperia</i> sp.	rein-orchid	X								
POACEAE										
<i>Agrostis microphylla</i>	small-leaved bentgrass									X
<i>Alopecurus pratensis</i> *	meadow foxtail						X			
<i>Avena barbata</i> *	wild oats					X	X			
<i>Briza maxima</i> *	rattlesnake grass						X			
<i>Bromus carinatus</i> var. <i>carinatus</i>	California brome							X		
<i>Bromus diandrus</i> *	rip-gut brome						X			
<i>Bromus hordeaceus</i> *	soft chess						X			
<i>Bromus laevipes</i>	woodland brome			X						
<i>Bromus madritensis</i> var. <i>rubens</i> *	red brome					X				
<i>Cynodon dactylon</i> *	Bermuda grass				X					
<i>Cynosurus echinatus</i> *	dog-tail grass					X				
<i>Dactylis glomerata</i> *	orchard grass					X				
<i>Festuca arundinacea</i> *	meadow fescue				X					
<i>Festuca californica</i>	California fescue							X		
<i>Festuca idahoensis</i>	blue bunchgrass					X				
<i>Glyceria leptostachya</i>	Davy's manna grass									X
<i>Hordeum brachyantherum</i> ssp. <i>calif.</i>	serpentine meadow barley									X
<i>Hordeum marinum</i> ssp. <i>gussoneanum</i> *	Mediterranean barley						X			
<i>Hordeum murinum</i> var. <i>leporinum</i> *	wall barley						X			
<i>Leymus triticoides</i>	creeping wild rye						X			
<i>Lolium multiflorum</i> *	Italian ryegrass					X	X			
<i>Melica californica</i>	California melic					X				
<i>Melica torreyana</i>	Torrey's melic							X		
<i>Nassella lepida</i>	small-flowered needlegrass					X		X		
<i>Nassella pulchra</i>	purple needlegrass					X				
<i>Phalaris aquatica</i> *	Harding grass						X			

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*denotes non-native species ?denotes species identification uncertain

Scientific Name	Common name	Int. live oak - blue oak	Int. live oak	Mixed oak	Valley oak riparian	Blue oak	Annual grasslands	East county chaparral	Ser-pentine chaparral	Other
<i>Piptatherum miliaceum</i> *	smilo				X					
<i>Poa bulbosa</i> *	bulbous bluegrass						X			
<i>Poa secunda</i> ssp. <i>secunda</i>	pine bluegrass					X				
<i>Poa</i> sp.						X				
<i>Polypogon maritimus</i> *	maritime beard grass					X				
<i>Taeniantherum caput-medusae</i> *	medusa head					X				
<i>Vulpia microstachya</i> var. <i>confusa</i>	Tracy's foxtail							X		
<i>Vulpia microstachya</i> var. <i>pauciflora</i>	Nuttall's foxtail							X		
POTAMOGETONACEAE										
<i>Potamogeton</i> sp.	pondweed									X
TYPHACEAE										
<i>Typha domingensis</i>	southern cattail				X					X

¹Compiled by Jake Ruygt. Field visits: April 15, 21, 2002 (Foley Creek – Long Canyon loop); March 8, 21, 31; April 14, 22, May 24, June 21 2003; April 10; June 19, 2004.

Appendix F.

Birds of the Knoxville Wildlife Area

Appendix F. Birds of the Knoxville Wildlife Area

Actual and potential bird species occurring at the Knoxville Wildlife Area. The list includes all species observed at the Homestake Mining Company, McLaughlin Mine, now the UC McLaughlin Reserve adjacent to the KWA (Enderlin 2002).

Common and Latin Name	Probable status at KWA*	Napa County Breeding Bird Atlas**	Observed during 2003-2004 biological inventory***
LOONS			
Common Loon (<i>Gavia immer</i>)	I		
GREBES			
Pied-billed Grebe (<i>Podilymbus podiceps</i>)	I		
Horned Grebe (<i>Podiceps auritus</i>)	I		
Eared Grebe (<i>Podiceps nigricollis</i>)	I		
Western Grebe (<i>Aechmophorus occidentalis</i>)	I		
Clark's Grebe (<i>Aechmophorus clarkii</i>)	I		
CORMORANTS			
Double-crested Cormorant (<i>Phalacrocorax auritus</i>)	I		
HERONS, BITTERNS			
Great Blue Heron (<i>Ardea herodias</i>)	YR		
Great Egret (<i>Casmerodius albus</i>)	I		
Cattle Egret (<i>Bubulcus ibis</i>)	I		
Green Heron (<i>Butorides virescens</i>)	YR		
VULTURES			
Turkey Vulture (<i>Cathartes aura</i>)	YR	Possible	X
DUCKS, GEESE, SWANS			
Greater White-fronted Goose (<i>Anser albifrons</i>)	I		
Snow Goose (<i>Chen caerulescens</i>)	I		
Canada Goose (<i>Branta canadensis</i>)	I		
Tundra Swan (<i>Cygnus columbianus</i>)	I		
Wood Duck (<i>Aix sponsa</i>)	I		
Gadwall (<i>Anas strepera</i>)	I		
American Wigeon (<i>Anas americana</i>)	I		
Mallard (<i>Anas platyrhynchos</i>)		Confirmed	X
Cinnamon Teal (<i>Anas cyanoptera</i>)	I		
Northern Shoveler (<i>Anas clypeata</i>)	I		
Northern Pintail (<i>Anas acuta</i>)	I		
Green-winged Teal (<i>Anas crecca</i>)	I		
Canvasback (<i>Aythya valisineria</i>)	I		
Redhead (<i>Aythya americana</i>)	I		
Ring-necked Duck (<i>Aythya collaris</i>)	I		
Lesser Scaup (<i>Aythya affinis</i>)	I		
Bufflehead (<i>Bucephala albeola</i>)	I		

Appendix F. Birds of the Knoxville Wildlife Area

Common and Latin Name	Probable status at KWA*	Napa County Breeding Bird Atlas**	Observed during 2003-2004 biological inventory***
DUCKS, GEESE, SWANS (continued)			
Common Goldeneye (<i>Bucephala clangula</i>)	I		
Hooded Merganser (<i>Lophodytes cucullatus</i>)	I		
Common Merganser (<i>Mergus merganser</i>)	I		
Red-breasted Merganser (<i>Mergus serrator</i>)	I		
Ruddy Duck (<i>Oxyura jamaicensis</i>)	I		
OSPREY			
Osprey (<i>Pandion haliaetus</i>)	YR		
HAWKS, KITES, EAGLES			
White-tailed Kite (<i>Elanus leucurus</i>)	YR		X
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	YR		X
Northern Harrier (<i>Circus Cyaneus</i>)	YR		
Sharp-shinned Hawk (<i>Accipiter striatus</i>)	YR	Possible	
Cooper's Hawk (<i>Accipiter cooperii</i>)	YR	Confirmed	
Red-shouldered Hawk (<i>Buteo lineatus</i>)	YR		
Red-tailed Hawk (<i>Buteo jamaicensis</i>)	YR	Confirmed	X
Golden Eagle (<i>Aquila chrysaetos</i>)	YR	Possible	
FALCONS			
American Kestrel (<i>Falco sparverius</i>)	YR	Confirmed	
Merlin (<i>Falco columbarius</i>)	M		
Peregrine Falcon (<i>Falco peregrinus</i>)	YR		
Prairie Falcon (<i>Falco mexicanus</i>)	YR		X, breeding confirmed
PHEASANTS, TURKEY			
Ring-necked Pheasant (<i>Phasianus colchicus</i>)	YR		
Turkey (<i>Meleagris gallopavo</i>)	YR	Confirmed	
QUAIL			
Mountain Quail (<i>Oreortyx pictus</i>)	YR	Confirmed	X
California Quail (<i>Callipela californica</i>)	YR	Confirmed	X
RAILS, COOTS			
American Coot (<i>Fulica americana</i>)	YR		X
PLOVERS			
Killdeer (<i>Charadrius vociferus</i>)	YR	Confirmed	
AVOCET			
American Avocet (<i>Recurvirostra americana</i>)	I		
SHOREBIRDS			
Greater Yellowlegs (<i>Tringa melanoleuca</i>)	I		
Spotted Sandpiper (<i>Actitis macularia</i>)	SR		
Dunlin (<i>Calidris alpina</i>)	I		
Short-billed Dowitcher (<i>Limnodromus griseus</i>)	I		

Appendix F. Birds of the Knoxville Wildlife Area

Common and Latin Name	Probable status at KWA*	Napa County Breeding Bird Atlas**	Observed during 2003-2004 biological inventory***
SHOREBIRDS (continued)			
Common Snipe (<i>Gallinago gallinago</i>)	I		
GULLS, TERNS			
Gull sp.	I		
Caspian Tern (<i>Sterna caspia</i>)	I		
DOVES			
Rock Dove (<i>Columba livia</i>)	YR	Confirmed	
Band-tailed Pigeon (<i>Columba fasciata</i>)	YR		
Mourning Dove (<i>Zenaida macroura</i>)	YR	Confirmed	X
CUCKOOS, ROADRUNNERS			
Greater Roadrunner (<i>Geococcyx californianus</i>)	YR		
BARN OWL			
Barn Owl (<i>Tyto alba</i>)	YR	Confirmed	X, breeding confirmed
TYPICAL OWLS			
Western Screech Owl (<i>Otus kennicottii</i>)	YR	Confirmed	X
Great Horned Owl (<i>Bubo virginianus</i>)	YR		
Northern Pygmy Owl (<i>Glaucidium gnoma</i>)	YR		X
Burrowing Owl (<i>Athene cunicularia</i>)	W		
Long-Eared Owl (<i>Asio otus</i>)	YR	Confirmed ¹	
Short-Eared Owl (<i>Asio flammeus</i>)	W		
Northern Saw-Whet Owl (<i>Aegolius acadicus</i>)	YR		
GOATSUCKERS			
Common poor-will (<i>Phalaenoptilus nutallii</i>)	SR	Possible	
SWIFTS			
Vaux's Swift (<i>Chaetura vauxi</i>)	M, SR?		
White-Throated Swift (<i>Aeronautes saxatalis</i>)	YR		X
HUMMINGBIRDS			
Black-Chinned Hummingbird (<i>Archilochus alexandri</i>)	M, SR?		
Anna's Hummingbird (<i>Calypte anna</i>)	YR	Confirmed	X
Calliope Hummingbird (<i>Stellula calliope</i>)	M		
Rufous Hummingbird (<i>Selasphorus rufus</i>)	M		
Allen's Hummingbird (<i>Selasphorus sasin</i>)	M, SR?		
KINGFISHERS			
Belted Kingfisher (<i>Ceryle alcyon</i>)	YR		X
WOODPECKERS			
Lewis' Woodpecker (<i>Melanerpes lewis</i>)	W, YR?		
Acorn Woodpecker (<i>Melanerpes formicivorus</i>)	YR	Confirmed	X
Red-breasted Sapsucker (<i>Sphyrapicus ruber</i>)	W		

Appendix F. Birds of the Knoxville Wildlife Area

Common and Latin Name	Probable status at KWA*	Napa County Breeding Bird Atlas**	Observed during 2003-2004 biological inventory***
WOODPECKERS (continued)			
Nuttall's Woodpecker (<i>Picoides nuttallii</i>)	YR	Possible	X
Downy Woodpecker (<i>Picoides pubescens</i>)	YR	Possible	X
Hairy Woodpecker (<i>Picoides villosus</i>)	YR	Confirmed	
Northern (Red-shafted) Flicker (<i>Colaptes auratus</i>)	YR	Confirmed	X
Pileated Woodpecker (<i>Dryocopus pileatus</i>)	YR	Confirmed	
TYRANT FLYCATCHERS			
Olive-Sided Flycatcher (<i>Contopus borealis</i>)	M, SR?		
Western Wood Pewee (<i>Contopus Sordidulus</i>)	SR	Confirmed	
Hammond's Flycatcher (<i>Empidonax hamondii</i>)	M		
Dusky Flycatcher (<i>Empidonax oberholseri</i>)	M		
Pacific-slope Flycatcher (<i>Empidonax difficilis</i>)	SR	Confirmed	X
Black Phoebe (<i>Sayornis nigricans</i>)	YR	Confirmed	X
Say's Phoebe (<i>Sayornis saya</i>)	W, YR?		X
Ash-throated Flycatcher (<i>Myiarchus cinerascens</i>)	SR	Confirmed	X
Western Kingbird (<i>Tyrannus verticalis</i>)	SR	Confirmed	X
SHRIKES			
Loggerhead Shrike (<i>Lanius ludovicianus</i>)	M		
VIREOS			
Cassin's Vireo (<i>Vireo cassinii</i>)	SR	Possible	
Hutton's Vireo (<i>Vireo huttoni</i>)	YR	Possible	X
Warbling Vireo (<i>Vireo gilvus</i>)	SR	Confirmed	
JAYS, CROWS			
Steller's Jay (<i>Cyanocitta cristata</i>)	I		
Western Scrub-Jay (<i>Aphelocoma californica</i>)	YR	Confirmed	X
Yellow-Billed Magpie (<i>Pica nuttalli</i>)	YR	Probable	
American Crow (<i>Corvus brachyrhynchos</i>)	YR	Possible	
Common Raven (<i>Corvus corax</i>)	YR	Probable	X
SWALLOWS			
Purple Martin (<i>Progne subis</i>)	M, SR?		
Tree Swallow (<i>Tachycineta bicolor</i>)	YR?		
Violet-green Swallow (<i>Tachycineta thalassina</i>)	SR	Confirmed	X
Northern Rough-winged Swallow (<i>Stelgidopteryx serripennis</i>)	SR		
Cliff Swallow (<i>Hirundo pyrrhonota</i>)	SR	Confirmed	
Barn Swallow (<i>Hirundo rustica</i>)	SR	Possible	
TITMOUSE			
Oak Titmouse (<i>Parus inornatus</i>)	YR	Confirmed	X

Appendix F. Birds of the Knoxville Wildlife Area

Common and Latin Name	Probable status at KWA*	Napa County Breeding Bird Atlas**	Observed during 2003-2004 biological inventory***
BUSHTIT			
Common Bushtit (<i>Psaltirparus minimus</i>)	YR	Confirmed	X
NUTHATCHES			
Red-Breasted Nuthatch (<i>Sitta canadensis</i>)	I		
White -breasted Nuthatch (<i>Sitta carolinensis</i>)	YR	Confirmed	X
CREEPERS			
Brown Creeper (<i>Certhia americana</i>)	W, YR?	Possible	
WRENS			
Rock Wren (<i>Salpinctes obsoletus</i>)	YR	Possible	
Canyon Wren (<i>Catherpes mexicanus</i>)	YR		X
Bewick's Wren (<i>Thryomanes bewickii</i>)	YR	Possible	X
House Wren (<i>Troglodytes aedon</i>)	SR	Confirmed	X
KINGLETS			
Golden-crowned Kinglet (<i>Regulus satrapa</i>)	W		
Ruby-crowned Kinglet (<i>Regulus calendula</i>)	W		
GNATCATCHERS			
Blue-gray Gnatcatcher (<i>Poliophtila caerulea</i>)	SR	Confirmed	X
THRUSHES, BLUEBIRDS, SOLITARIES			
Western Bluebird (<i>Sialia mexicana</i>)	YR	Confirmed	X
Hermit Thrush (<i>Catharus guttatus</i>)	W		X
American Robin (<i>Turdus migratorius</i>)	YR	Confirmed	X
Varied Thrush (<i>Ixoreus naevius</i>)	W		
WRENTITS			
Wrentit (<i>Chamaea fasciata</i>)	YR	Probable	X
MOCKINGBIRDS, THRASHERS			
Northern Mockingbird (<i>Mimus polyglottos</i>)	I		
California Thrasher (<i>Toxostoma redivivum</i>)	YR	Confirmed	X
STARLINGS			
European Starling (<i>Sturnus vulgaris</i>)	YR	Confirmed	
PIPITS			
American Pipit (<i>Anthus rubescens</i>)	W		
WAXWINGS			
Cedar Waxwing (<i>Bombycilla cedrorum</i>)	W		
SILKY FLYCATCHERS			
Phainopepla (<i>Phainopepla nitens</i>)	I, SR?		
WOOD WARBLERS			
Orange-crowned Warbler (<i>Vermivora celata</i>)	SR	Confirmed	X
Nashville Warbler (<i>Vermivora ruficapilla</i>)	M		
Yellow Warbler (<i>Dendroica petechia</i>)	M, SR?		

Appendix F. Birds of the Knoxville Wildlife Area

Common and Latin Name	Probable status at KWA*	Napa County Breeding Bird Atlas**	Observed during 2003-2004 biological inventory***
WOOD WARBLERS (continued)			
Yellow-rumped Warbler (<i>Dendroica coronata</i>)	W		
Black-throated Gray Warbler (<i>Dendroica nigrescens</i>)	M		
Townsend's Warbler (<i>Dendroica townsendi</i>)	M		
Hermit Warbler (<i>Dendroica occidentalis</i>)	M		
MacGillivray's Warbler (<i>Oporornis tolmiei</i>)	M		
Wilson's Warbler (<i>Wilsonia pusilla</i>)	SR	Probable	
Yellow-Breasted Chat (<i>Icteria virens</i>)	M, SR?		
TANAGERS			
Western Tanager (<i>Piranga ludoviciana</i>)	SR	Possible	
SPARROWS, TOWHEES			
Spotted Towhee (<i>Pipilo maculatus</i>)	YR	Confirmed	X
California Towhee (<i>Pipilo crissalis</i>)	YR	Confirmed	X
Rufous-crowned Sparrow (<i>Aimophila ruficeps</i>)	YR	Probable	X
Chipping Sparrow (<i>Spizella passerina</i>)	SR		
Lark Sparrow (<i>Chondestes grammacus</i>)	YR	Confirmed	X
Sage Sparrow (<i>Amphispiza belli</i>)	YR	Probable	X
Savannah Sparrow (<i>Passerculus sandwichensis</i>)	W		
Fox Sparrow (<i>Passerilla iliaca</i>)	W		X
Song Sparrow (<i>Melospiza melodia</i>)	YR		
Lincoln's Sparrow (<i>Melospiza lincolni</i>)	W		
White-crowned Sparrow (<i>Zonotrichia leucophrys</i>)	W		X
Golden-crowned Sparrow (<i>Zonotrichia atricapilla</i>)	W		X
Dark-eyed (Oregon) Junco (<i>Junco hyemalis</i>)	W, YR?	Possible	X
GROSBEAKS, BUNTINGS			
Black-Headed Grosbeak (<i>Pheucticus melanocephalus</i>)	SR	Confirmed	X
Lazuli Bunting (<i>Passerina amoena</i>)	SR	Possible	
MEADOWLARKS, BLACKBIRDS, ORIOLES			
Red-winged Blackbird (<i>Agelaius phoeniceus</i>)	YR	Possible	X
Tricolored Blackbird (<i>Agelaius tricolor</i>)	I, SR?		
Western Meadowlark (<i>Sturnella neglecta</i>)	YR	Confirmed	X
Brewer's Blackbird (<i>Euphagus cyanocephalus</i>)	YR	Confirmed	
Brown-Headed Cowbird (<i>Molothrus ater</i>)	SR	Probable	
Northern (Bullock's) Oriole (<i>Icterus galbula</i>)	SR	Probable	X
FINCHES, GOLDFINCHES			
Purple Finch (<i>Carpodacus purpureus</i>)	YR	Probable	
House Finch (<i>Carpodacus mexicanus</i>)	YR	Confirmed	
Pine Siskin (<i>Carduelis pinus</i>)	W		

Appendix F. Birds of the Knoxville Wildlife Area

Common and Latin Name	Probable status at KWA*	Napa County Breeding Bird Atlas**	Observed during 2003-2004 biological inventory***
FINCHES, GOLDFINCHES (continued)			
Lesser Goldfinch (<i>Carduelis psaltria</i>)	YR	Confirmed	X
Lawrence's Goldfinch (<i>Carduelis lawrencei</i>)	SR	Confirmed	
American Goldfinch (<i>Carduelis tristis</i>)	W		

*Status: YR = year round resident, SR = spring/summer resident, W = winter resident, M = present during migration, I = incidental (appropriate habitat probably not present at the KWA, but may be present nearby).

**Breeding status in blocks containing the KWA (555295, 555290, 560290) from the *Breeding Birds of Napa County* (Berner et al. 2003).

***Birds observed incidentally while conducting targeted surveys for rare plants, weeds, amphibians.

¹Breeding confirmed June 1990 on the South Knoxville Ranch by George Gamble and Bill Grummer.

Appendix G.

Mammals of the Knoxville Wildlife Area

Appendix G. Mammals of the Knoxville Wildlife Area

Actual and potential mammal species occurring at the Knoxville Wildlife Area. The list includes all species observed at the Homestake Mining Company, McLaughlin Mine, now the UC McLaughlin Reserve adjacent to the KWA (Enderlin 2002).

Common and Latin Name	Sighted or Collected at McLaughlin Reserve
INSECTIVORES	
Ornate Shrew (<i>Sorex ornatus</i>)	X
Trowbridge Shrew (<i>Sorex trowbridgii</i>)	
MOLES	
California Mole (<i>Scapanus latimanus</i>)	X
BATS	
Big Brown Bat (<i>Eptesicus fuscus</i>)	X
Brazilian Free-Tailed Bat (<i>Tadarida brasiliensis</i>)	X
California Myotis (<i>Myotis californicus</i>)	X
Fringed Myotis (<i>Myotis thysanodes</i>)	X
Little Brown Bat (<i>Myotis lucifugus</i>)	
Hoary Bat (<i>Lasiurus cinereus</i>)	X
Long-Eared Myotis (<i>Myotis evotis</i>)	X
Long-Legged Myotis (<i>Myotis volans</i>)	X
Pallid Bat (<i>Antrozous pallidus</i>)	X
Silver Haired Bat (<i>Lasionycteris noctivagans</i>)	
Red Bat (<i>Lasiurus blossevillii</i>)	X
Spotted Bat (<i>Euderma maculatum</i>)	
Western Mastiff Bat (<i>Eumops perotis</i>)	
Townsend's Big-eared Bat (<i>Corynorhinus townsendii</i>)	X
Western Pipistrelle (<i>Pipistrellus hesperus</i>)	X
Yuma Myotis (<i>Myotis yumanensis</i>)	X
CARNIVORES	
Badger (<i>Taxidea taxus</i>)	X
Black Bear (<i>Ursus americanus</i>)	X
Bobcat (<i>Lynx rufus</i>)	X
Common Striped Skunk (<i>Mephitis mephitis</i>)	X
Coyote (<i>Canis latrans</i>)	X
Gray Fox (<i>Urocyon cinereoargenteus</i>)	X
Mink (<i>Mustela vison</i>)	X
Mountain Lion (<i>Felis concolor</i>)	X
Raccoon (<i>Procyon lotor</i>)	X
Red Fox (<i>Vulpes vulpes</i>)	X

Appendix G. Mammals of the Knoxville Wildlife Area

Common and Latin Name	Sighted or Collected at McLaughlin Reserve
CARNIVORES (continued)	
Ringtail (<i>Bassariscus astutus</i>)	X
River Otter (<i>Lontra canadensis</i>)	X
Western Spotted Skunk (<i>Spilogale gracilis</i>)	
LAGOMORPHS	
Black-tailed Jackrabbit (<i>Lepus californicus</i>)	X
Brush Rabbit (<i>Sylvilagus bachmani</i>)	X
MARSUPIALS	
Opossum (<i>Didelphis virginiana</i>)	X
RODENTS	
Botta's Pocket Gopher (<i>Thomomys bottae</i>)	X
Brush Mouse (<i>Peromyscus boylii</i>)	X
California Ground Squirrel (<i>Spermophilus beecheyi</i>)	X
California Vole (<i>Microtus californicus</i>)	X
Deer Mouse (<i>Peromyscus maniculatus</i>)	X
Dusky-footed Woodrat (<i>Neotoma fuscipes</i>)	X
Heermanns Kangaroo Rat (<i>Dipodomys heermanni</i>)	X
Pacific Jumping Mouse (<i>Zapus trinotatus</i>)	X
Piñon Mouse (<i>Peromyscus truei</i>)	X
Porcupine (<i>Erethizon dorsatum</i>)	X
San Joaquin Pocket Mouse (<i>Perognathus inornatus</i>)	
Sonoma Chipmunk (<i>Tamias sonomae</i>)	X
Townsend's Chipmunk (<i>Tamias townsendi</i>)	
Western Gray Squirrel (<i>Sciurus griseus</i>)	X
Western Harvest Mouse (<i>Reithrodontomys megalotis</i>)	X
UNGULATES	
Mule Deer (<i>Odocoileus hemionus</i>)	X
Pig (<i>Sus scrofa</i>)	X
Pronghorn (<i>Antilocapra americana</i>)	X
Tule Elk (<i>Cervus elaphus nannodes</i>)	X

This list includes mammals sighted as well as those thought to occur on the Reserve.

Appendix H.

Fish and Herptiles of the Knoxville Wildlife Area

Appendix H. Fish and Herptiles of the Knoxville Wildlife Area

Common and Latin Name	Sighted or Collected at McLaughlin Reserve	Sighted or Collected at the KWA During 2003/2004 Surveys
FISHES		
California roach (<i>Hesperoleucus symmetricus</i>)	Collected in Knoxville Creek	
SALAMANDERS		
Arboreal Salamander (<i>Aneides lugubris</i>)		
California Newt (<i>Taricha torosa</i>)	X	X
California Slender Salamander (<i>Batrachoseps attenuatus</i>)		
Ensatina (<i>Ensatina eschscholtzi</i>)		
Rough-skinned Newt (<i>Taricha granulosa</i>)	X	
TOADS AND FROGS		
Bullfrog (<i>Rana catesbeiana</i>)	X	X
Foothill Yellow-legged Frog (<i>Rana boylei</i>)	X	X
Pacific Tree Frog (<i>Hyla regilla</i>)	X	X
Red-legged Frog (<i>Rana aurora</i>)	X	
Western Toad (<i>Bufo boreas</i>)	X	
LIZARDS		
California Whiptail (<i>Cnemidophorus tigris</i>)	X	
Coast Horned Lizard (<i>Phrynosoma coronatum</i>)		
Northern Alligator Lizard (<i>Gerrhonotus coeruleus</i>)	X	
Northern Sagebrush Lizard (<i>Uta stansburiana</i>)	X	
Southern Alligator Lizard (<i>Gerrhonotus multicarinatus</i>)	X	
Western Fence Lizard (<i>Sceloporus occidentalis</i>)	X	
Western Skink (<i>Eumeces skiltonianus</i>)	X	
SNAKES		
Common Kingsnake (<i>Lampropeltis getulus</i>)	X	
California Mountain Kingsnake (<i>Lampropeltis zonata</i>)	X	
California Red-sided Garter (<i>Thamnophis sirtalis infernalis</i>)	X	X
Coachwhip (<i>Masticophis flagellum</i>)		
Western Yellowbelly Racer (<i>Coluber constrictor</i>)	X	X
Gopher Snake (<i>Pituophis melanoleucus</i>)	X	
Long-Nosed Snake (<i>Rhinocheilus lecontei</i>)		
Night Snake (<i>Hypsiglena torquata</i>)		

Appendix H. Fish and Herptiles of the Knoxville Wildlife Area

Common and Latin Name	Sighted or Collected at McLaughlin Reserve	Sighted or Collected at the KWA During 2003/2004 Surveys
SNAKES (cont.)		
Northern Pacific Rattlesnake (<i>Crotalus viridis oreganus</i>)	X	X
Ringneck (<i>Diadophis punctatus</i>)	X	
Rubber Boa (<i>Charina bottae</i>)		
Sharp-Tailed Snake (<i>Contia teuis</i>)		
Striped Racer (<i>Masticophis lateralis</i>)	X	
Western Aquatic Garter Snake (<i>Thamnophis couchi</i>)	X	
Western Terrestrial Garter Snake (<i>Thamnophis elegans</i>)	X	
TURTLES		
Western Pond Turtle (<i>Clemmys marmorata</i>)	X	X

Appendix I.

Prioritized Control Plans for Non-native Invasive Species at the Knoxville Wildlife Area

***Note: the proposed measures are as recommended primarily by (Bossard et al. 2000) and by Element Stewardship Abstracts produced by the Nature Conservancy and available at <http://tncweed.ucdavis.edu/esadocs/>.*

Scientific name: *Tamarix parviflora*
Common name: tamarisk, salt cedar
Updated 9/2003

PRIORITY 1

❖ **Description**

Tamarisk is a many-branched shrub or tree less than 26 feet tall with small, with scale-like leaves that contain salt glands, and small white to deep-pink flowers.

❖ **Current Distribution on the Site and Treatments to Date**

Most tamarisk on the KWA is concentrated in riparian habitats along Knoxville and Eticuera Creeks. The Department and the University of California initiated a cooperative tamarisk eradication program in December 2001. CDF inmate crews removed growth to bare stumps, which were painted with a Garlon mix by DFG personnel. The initial effort ran through April 2002, from the upper end of the Knoxville Creek drainages (on the McLaughlin Reserve) to the Long Canyon corral. CDF crews returned in November 2002 and worked through March 2003 cutting tamarisk to stumps along Eticuera Creek (from the Long Canyon corral to the south end of the KWA). This time DFG personnel sprayed the fresh stumps with a less concentrated mix of Garlon. Resprouts were sprayed most intensively during summer 2003, but some during summer 2002. In October 2003, test spraying with Stalker showed far better results, and a re-spray of the entire drainage using this material is anticipated for late summer 2004 or early 2005.

❖ **Damage and Threats**

Tamarisk has the ability to crowd out native riparian species, reducing both plant and animal diversity, and increasing soil salinity to favor itself. It also alters hydrology, drying up springs and riparian areas and streams and lowering surface water tables.

❖ **Measurable Goals and Objectives**

Eradicate tamarisk from the KWA and monitor treated infestations for resprouting.

❖ **Management Options**

Prevention—Annual surveys to enable early detection and control, as well as prevention of seed introductions and disturbances that contribute to its success (fire, increased soil salinity, soil disturbance, etc) are critical to limiting tamarisk's distribution.

Eradication and control

- *Physical control:* Manual/mechanical methods do little to control tamarisk, since it resprouts vigorously following cutting or burning. Root plowing and cutting can clear heavy infestations, but only when followed up with herbicide treatments. Seedlings and small plants can be hand pulled. Fire does not kill tamarisk roots, but helps to thin heavy infestations, while flooding for 1-2 years can kill most salt cedar plants in a thicket (Lovich 2000).
- *Biological control:* Insects and fungi are currently being tested for tamarisk control. Cattle have been shown to consume considerable amounts of sprout growth (Lovich 2000).
- *Chemical control:* Heavy infestations often require stand thinning through controlled burns or mechanical removal prior to herbicide application. Herbicides commonly used to combat tamarisk include imazapyr, triclopyr, and glyphosate (Bossard et al. 2000). Perhaps the best is to apply imazapyr as “Arsenal” to the foliage, especially when a tank mix is used with a glyphosate herbicide such as Rodeo or RoundupPro (Lovich 2000). Arsenal is not registered for use in California, but “Stalker” is another imazapyr-based herbicide that is.
- *Integrated control:* The most frequently used method in California is to cut the shrub off to within 5 cm of the ground and apply triclopyr, either as Garlon 4 or Garlon 3A to the stump and around the perimeter of the cut stems within 1 minute of cutting, the latter of which should be applied during the growing season (Lovich 2000). Foliar application of herbicides to resprouts should be conducted within 4-12 months, and are best conducted with glyphosate or imazapyr; best results are achieved via application in late spring to early fall during good growing conditions (Lovich 2000).

ACTIONS PLANNED (Treatments and monitoring)

Summer 2004 – Spring 2005: Spray resprouts with Stalker.

Summer 2005: Survey for resprouting, continued treatments as needed.

Scientific name: *Lepidium latifolium*
Common name: Perennial pepperweed
Updated 9/2003

****Adapted from Myers-Rice and Tu (2001)**

PRIORITY 2

❖ Description

Perennial pepperweed is a broad-leaved member of the mustard family that grows up to 2 feet tall in dense stands. It has tiny clusters of white flowers at the ends of branches, flowers in the late spring-mid-summer, and is a prolific seed producer. Seed viability may be short (Miller et al. 1986).

❖ Current Distribution on the Site and Treatments to Date

Perennial pepperweed is largely limited to Knoxville Creek, centered around the historic Knoxville town site and including the surrounding roads, streams, gullies, and grasslands. It occurs in greatest abundance on the border with the McLaughlin Reserve, so an effective eradication strategy will require coordination with UC Davis. Department personnel sprayed pepperweed with Telar in late April and early May 2004 along seasonal creeks and other known areas of infestation.

❖ Damage and Threats

Perennial pepperweed threatens native species by its ability to form monospecific stands, as well as by increasing soil salinity (Blank and Young 1997). Should infestations become too dense, restoration activities may need to include soil remediation to address the salinity issue.

❖ Measurable Goals and Objectives

Prevent invasion of still-uninvaded habitats, contain and eradicate major infestation near Knoxville; and eradicate all satellite infestations.

- (1) Eradicate all satellite infestations by summer, 2005.
- (2) Contain and reduce acreage in the Knoxville area by 75% by summer, 2006;
- (3) Eradicate Knoxville infestations by Summer, 2007.
- (4) Replant infested areas with local willows, cottonwoods, and oaks.

❖ Management Options

Prevention—As control of perennial pepperweed is highly difficult (Howald 2000), prevention of new seed introductions and disturbances to soils and native plants that increase invasibility, as well as early detection and rapid eradication of new infestations, are key.

Eradication and control—An experimental and integrated approach will likely be needed to eradicate and control perennial pepperweed. Appropriate measures may include:

- *Physical control:* Unlikely, alone, to control perennial pepperweed because new plants quickly regenerate from pieces of rootstock left in the soil (Young et al. 1995). As a result, disking can increase the number of root fragments and spread them, and has worsened infestations in areas such as Grizzly Island. Cutting, pulling, and repeated mowing or weed whacking may reduce seed production, but mowing followed by herbicide application may be required to achieve complete control. The litter layer must be removed along with plants for successful restoration of native species.
- *Controlled burning:* unlikely to provide effective control, though control may be more effective where there is more fuel available to carry fire, such as in the Knoxville grasslands.
- *Inundation:* Perennial pepperweed may be intolerant of prolonged inundation during the growing season.
- *Biological control:* seems unlikely to provide feasible control due to the large number of crop species in the mustard family, as well as presence of several rare and threatened/endangered species in the mustard family.
- *Chemical control:* The most effective chemical control has been chlorsulfuron (Telar), methsulfuron methyl (Escort), and imazapyr (Arsenal), based on field trials (Cox 1997). Neither Escort or Arsenal is currently registered for use in California.

Trumbo (1994) showed that chlorsulfuron, triclopyr, and glyphosate at Grizzly Island Wildlife Area each controlled perennial pepperweed. Telar was most effective, with one application resulting in a reduction in cover of more than 95% after 2 years. In Lassen County, CA and Nevada (Young et al. 1998), one application of Telar provided up to 3 years of nearly complete control, with the best control achieved by application during the bud stage, though also with late spring and early fall applications. Telar was applied at 0.75-1 oz/acre, mixed in 30 gallons of water with 0.5% non-ionic surfactant. It is selective against broadleaved plants, which helps to prevent impacts to desirable species. Herbicide application has been found to be more effective when used alone than with fire or disking.

❖ Actions Planned

Fall 2004: Coordinate with McLaughlin Reserve to implement plan across Reserve/Wildlife Area boundary.

Summer 2005: Spray satellite populations with Telar.
Winter 2005: Plant locally collected willows, cottonwoods, and valley oaks.
Summer 2006: Monitor satellite populations, respray as necessary. Spray margins of main Knoxville population with Telar.
Winter 2006: Plant locally collected willows, cottonwoods, and valley oaks.
Summer 2007: Monitor resprouts from previously sprayed area, respray as necessary. Continue to spray main Knoxville population.
Winter 2007: Plant locally collected willows, cottonwoods, and valley oaks.
Summer 2008: Continue to monitor populations and respray as necessary.

Scientific name: *Centaurea solstitialis*
Common name: Yellow starthistle
Updated 9/2003

PRIORITY 3

❖ **Description**

Yellow starthistle is an annual to biennial forb that germinates in the fall and produces a rosette during early spring, during which time it extends a deep taproot downward. It bolts in the late spring after annual grasses senesce and flowers during late June-August.

❖ **Current Distribution on the Site and Treatments to Date**

Starthistle is distributed throughout annual grasslands within the KWA although it is most prevalent in areas that have received past disturbance (e.g., the historic Knoxville town site), and along roads, trails, creeks, and around stock ponds (Appendix B). Away from roads and disturbed sites, its distribution is limited and patchy. In May and June 2004, starthistle was test sprayed by Department personnel using Transline around parking areas, the Long Canyon corrals, and several fields in Foley Canyon. The fields in Foley Canyon were disked prior to spraying.

❖ **Damage and Threats**

Starthistle reduces native biodiversity by forming monospecific stands, and can hinder the establishment, reproduction, and persistence of native species (DiTomaso and Gerlach 2000). It also degrades wildlife habitats and hinders public access.

❖ **Measurable Goals and Objectives**

Reduce starthistle cover in heavily infested areas and restore competitive stands of native species. Prevent and eradicate isolated infestations, and prevent spread into uninfested areas, including by:

- (1) Eradicating the species along roads and trails leading to uninfested areas by 2008,
- (2) Reducing and eventually eradicating dense infestations in grassland and riparian habitats along Knoxville and Foley Creeks by 50% by 2007, 75% by 2009, 100% by 2011, and
- (3) cleaning vehicles and shoes before entering uninfested areas.

❖ **Management Options**

Prevention—Highest priority will be given to preventing and eradicating new outbreaks and to removing the plant from currently infested roads that lead to uninfested areas.

Eradication and control—In areas where starthistle has become dominant, such as grasslands along Knoxville Creek, one or more options may be used to control its spread, though it will be critical to ensure that control options do not threaten native species, soils, water quality, or ecosystem processes:

- *Physical control*: repeated mowing/weed whacking during the early flowering or bolting stage; or hand pulling of smaller infestations during the same stages, may work, but may also negatively impact late-season forbs.
- *Controlled burning*: prescribed fire during the early flowering or bolting stage has been shown to reduce seed production, and three years of it may almost entirely remove infestations and seed banks (DiTomaso et al. 1999). Burning at this time may also reduce the cover of other exotics such as medusahead (DiTomaso 2000), and may therefore be applied as part of a whole-systems approach to restoring communities from starthistle invasion.
- *Carefully timed controlled grazing*: during the bolting stage, grazing by goats, especially has been shown to reduce seed production (Thomsen et al. 1993; DiTomaso 2000), though the intensity of grazing required may be detrimental to native species and soils, and inputs of urine and dung may increase soil fertility and invasibility (Thomsen et al. 1993; Tu et al. 2001).
- *Chemical control*: early season herbicide application of Clopyralid (Transline) has been shown to dramatically reduce starthistle cover when applied at low levels (1.5-4 oz/acre) from January to May, but has detrimental effects on some native species within the Apiaceae, Asteraceae, Fabaceae, Polygonaceae, Solanaceae, and Violaceae families and has residual effects on soils for 1 year.
- *Biological control*: Six biological control species have been introduced to reduce yellow starthistle abundance, but are only roughly 40% effective (DiTomaso 2002). Some reports indicate that these insects are beginning to have an increasingly pronounced effect on this weed.
- *Restoration*: Native species such as perennial bunchgrasses and tarweeds have been shown to increase the resistance of habitats to starthistle invasion (Dukes 2002; Gelbard 2003). Fortunately, controlled burns timed to reduce starthistle reproduction and cover have been shown to favor native bunchgrass species such as *Nassella pulchra* (DiTomaso et al. 1999).

Overall, several years of integrated treatments, combined with monitoring to enable early detection and rapid eradication of new infestations will undoubtedly be necessary to contain and eradicate yellow starthistle and to restore invaded habitats.

Appendix I References

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- Myers-Rice, B., and M. Tu. 2001, Weed management for the Cosumnes River Preserve, Galt, CA. 2001-2005. The Nature Conservancy Wildland Invasive Species Program, Davis, CA.
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Appendix J.
Notice of Completion,
Environmental Checklist
and Negative Declaration

Form A**Notice of Completion & Environmental Document Transmittal****SCH #** _____

Mail to: State Clearinghouse, PO Box 3044, Sacramento, CA 95812-3044 916/445-0613

Project Title: _____

Lead Agency: _____ Contact Person: _____

Street Address: _____ Phone: _____

City: _____ Zip: _____ County: _____

Project Location:

County: _____ City/Nearest Community: _____

Cross Streets: _____ Zip Code: _____ Total Acres: _____

Assessor's Parcel No. _____ Section: _____ Twp. _____ Range: _____ Base: _____

Within 2 Miles: State Hwy #: _____ Waterways: _____

Airports: _____ Railways: _____ Schools: _____

Document Type:

CEQA: ☐ NOP ☐ Supplement/Subsequent EIR **NEPA:** ☐ NOI **Other:** ☐ Joint Document
☐ Early Cons (Prior SCH No.) _____ ☐ EA ☐ Final Document
☐ Neg Dec ☐ Other _____ ☐ Draft EIS ☐ Other _____
☐ Draft EIR ☐ FONSI

Local Action Type:

☐ General Plan Update ☐ Specific Plan ☐ Rezone ☐ Annexation
☐ General Plan Amendment ☐ Master Plan ☐ Prezone ☐ Redevelopment
☐ General Plan Element ☐ Planned Unit Development ☐ Use Permit ☐ Coastal Permit
☐ Community Plan ☐ Site Plan ☐ Land Division (Subdivision, etc.) ☐ Other _____

Development Type:

☐ Residential: Units _____ Acres _____ ☐ Water Facilities: Type _____ MGD _____
☐ Office: Sq.ft. _____ Acres _____ Employees _____ ☐ Transportation: Type _____
☐ Commercial: Sq.ft. _____ Acres _____ Employees _____ ☐ Mining: Mineral _____
☐ Industrial: Sq.ft. _____ Acres _____ Employees _____ ☐ Power: Type _____ Watts _____
☐ Educational _____ ☐ Waste Treatment: Type _____
☐ Recreational _____ ☐ Hazardous Waste: Type _____
☐ Other: _____

Funding (approx.): Federal \$ _____ State \$ _____ Total \$ _____

Project Issues Discussed in Document:

☐ Aesthetic/Visual ☐ Flood Plain/Flooding ☐ Schools/Universities ☐ Water Quality
☐ Agricultural Land ☐ Forest Land/Fire Hazard ☐ Septic Systems ☐ Water Supply/Groundwater
☐ Air Quality ☐ Geologic/Seismic ☐ Sewer Capacity ☐ Wetland/Riparian
☐ Archeological/Historical ☐ Minerals ☐ Soil Erosion/Compaction/Grading ☐ Wildlife
☐ Coastal Zone ☐ Noise ☐ Solid Waste ☐ Growth Inducing
☐ Drainage/Absorption ☐ Population/Housing Balance ☐ Toxic/Hazardous ☐ Landuse
☐ Economic/Jobs ☐ Public Services/Facilities ☐ Traffic/Circulation ☐ Cumulative Effects
☐ Fiscal ☐ Recreation/Parks ☐ Vegetation ☐ Other _____

Present Land Use/Zoning/General Plan Designation:**Project Description:**

Reviewing Agencies Checklist

Form A, continued

KEY

S = Document sent by lead agency

X = Document sent by SCH

✓ = Suggested distribution

Resources Agency

- _____ Boating & Waterways
- _____ Coastal Commission
- _____ Coastal Conservancy
- _____ Colorado River Board
- _____ Conservation
- _____ Fish & Game
- _____ Forestry & Fire Protection
- _____ Office of Historic Preservation
- _____ Parks & Recreation
- _____ Reclamation Board
- _____ S.F. Bay Conservation & Development Commission
- _____ Water Resources (DWR)

Business, Transportation & Housing

- _____ Aeronautics
- _____ California Highway Patrol
- _____ CALTRANS District # _____
- _____ Department of Transportation Planning (headquarters)
- _____ Housing & Community Development

Food & Agriculture

Health & Welfare

- _____ Health Services _____

State & Consumer Services

- _____ General Services
- _____ OLA (Schools)

Environmental Protection Agency

- _____ Air Resources Board
- _____ California Waste Management Board
- _____ SWRCB: Clean Water Grants
- _____ SWRCB: Delta Unit
- _____ SWRCB: Water Quality
- _____ SWRCB: Water Rights
- _____ Regional WQCB # _____ (_____)

Youth & Adult Corrections

- _____ Corrections

Independent Commissions & Offices

- _____ Energy Commission
- _____ Native American Heritage Commission
- _____ Public Utilities Commission
- _____ Santa Monica Mountains Conservancy
- _____ State Lands Commission
- _____ Tahoe Regional Planning Agency

_____ Other _____

Public Review Period (to be filled in by lead agency)

Starting Date _____

Ending Date _____

Signature _____

Date _____

Lead Agency (Complete if applicable):

Consulting Firm: _____

Address: _____

City/State/Zip: _____

Contact: _____

Phone: (____) _____

For SCH Use Only:

Date Received at SCH _____

Date Review Starts _____

Date to Agencies _____

Date to SCH _____

Clearance Date _____

Notes:

Applicant: _____

Address: _____

City/State/Zip: _____

Phone: (____) _____

FINAL ENVIRONMENTAL CHECKLIST / NEGATIVE DECLARATION

The Knoxville Wildlife Area Management Plan is a project under the California Environmental Quality act that requires environmental analysis. This Appendix includes the full text of the Environmental Checklist/Negative Declaration that was prepared in conformance with the requirements of the State CEQA Guidelines.

Environmental Checklist Form

1. **Project title:** Knoxville Wildlife Area Management Plan
2. **Lead agency name and address:**
California Department of Fish and Game
Post Office Box 47
Yountville, CA 94599
3. **Contact person and phone number:**
Tina Fabula, DFG Assistant Lands Coordinator
(707) 944-5538
4. **Project location:** The Wildlife Area is reached from the northern tip of Lake Berryessa off Berryessa Knoxville Road. The county road bisects the Wildlife Area in a north-south direction.
5. **Project sponsor's name and address:**
California Department of Fish and Game
Post Office Box 47
Yountville, CA 94599
6. **General plan designation:**
Napa: Agricultural and Open Space
7. **Zoning:**
Napa: Agricultural and Open Space
8. **Description of project:**

The project is the Knoxville Wildlife Area Management Plan. The primary purpose of the Wildlife Area is to protect and enhance habitat for wildlife species, and to provide the public with compatible, wildlife-related recreational uses. In addition, the Knoxville Wildlife area was acquired specifically to restore the riparian habitat of Eticuera, Foley, Long Canyon, and Knoxville Creeks. The Wildlife Area provides habitat for Special Status species, game species and other native species.

The Plan provides a description of the Wildlife Area and its environment with emphasis on the natural ecological processes and native and non-native plants and animals that exist there. It also includes an evaluation of public uses that are compatible with the purpose of the Wildlife Area, and an evaluation of the appropriateness of adopting a State Wilderness designation.

This Initial Study is intended to consider the whole of the project. As such, this project and this Negative Declaration includes the following components:

- The ongoing operation of the Wildlife Area including the public uses incorporated in

this Plan.

- Maintenance activities to sustain the oak woodland, riparian, chaparral and grassland habitats including control of nonnative, invasive species.
- Installation of minor improvements to the Wildlife Area that do not involve substantial physical disruption of the Wildlife Area, such as parking areas, fencing, signage, wildlife water supply, and possibly restrooms.
- Maintenance of existing roads and other improvements to the Wildlife Area.
- The monitoring of plant and animal populations, public use, and related scientific research.
- Ongoing coordination with public agencies and private entities consistent with the objectives of this Plan.
- The dissemination of public information regarding the Wildlife Area that may include hardcopy and online data as well as other media.
- Regular updating of Wildlife Area regulations.
- Enforcement of duly adopted laws and regulations.

This Plan is a general policy guide to the management of the Wildlife Area. It does not specifically authorize or make any commitment to any substantive physical changes to the Wildlife Area. With the exception of minor operations and maintenance activities, any physical changes that are not currently approved will require subsequent authorizations and approvals. Because any such possible changes will be a part of projects, which have not yet been conceived, designed, or funded, it is not possible to reasonably evaluate the impacts of any such subsequent projects. Any such subsequent projects not included within the scope of this project will require analysis pursuant to CEQA when such projects are conceived and proposed.

9.

Surrounding land uses and setting: Briefly describe the project's surroundings:

The Knoxville Wildlife Area consists of 8,196 acres in two discrete units. The primary unit, also known as the South Knoxville Ranch, consists of approximately 8,080 acres at the northeastern end of Napa County and parts of Yolo County. The South Knoxville Ranch is bordered to the north by McLaughlin Reserve (University of California) and the Cache Creek Natural Area (Bureau of Land Management (BLM)), and Knoxville Recreation Area (BLM). Other public ownerships in the nearby area include Lake Berryessa (Bureau of Reclamation (BOR)), and Cache Creek Wildlife Area, Cedar Roughs Wildlife Area, Lake Berryessa Wildlife Area; all owned by the Department. There is one 80-acre private ownership on the west boundary adjacent to Berryessa Knoxville Road. It is currently vacant property, having no buildings or improvements, only the remains of a stone chimney.

The McLaughlin Reserve is closed to public access and devoted primarily to academic teaching, and research. The BLM Knoxville Recreation Area is open to the public and permits grazing, camping, off-road-vehicle use, hunting, and many other types of recreational options. The BLM Cache Creek Management Area is open to the public, allows camping and hunting, but prohibits motorized access and grazing. The area is accessed through the DFG Cache Creek Wildlife Area lands and is cooperatively managed with Fish and Game. The Lake Berryessa Wildlife Area (surface management only - DFG) is open to the public but not to hunting or OHV use. The Cedar Roughs Wildlife Area (DFG) provides foot access to the much larger Cedar Roughs Wilderness Study Area (BLM) and is open to the public for hunting.

The smaller 92.5-acre Adams Creek unit of the Wildlife Area, consists of three irregularly-

shaped parcels located about 3.25 miles southwest of the southern tip of the primary unit. These parcels are located near Adams Creek and are surrounded by or adjacent to the BLM's Knoxville Recreation public lands.

10. **Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement).**

No other public agency approval is required for the adoption of the Knoxville Wildlife Area Management Plan.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

If implemented as written, this Plan could result in a "Potentially Significant Impact" involving at least one area of the environmental factors checked below, as indicated in the Environmental Checklist/Initial Study on the following pages.

<input type="checkbox"/>	Aesthetics	<input type="checkbox"/>	Agriculture Resources	<input type="checkbox"/>	Air Quality
<input type="checkbox"/>	Biological Resources	<input type="checkbox"/>	Cultural Resources	<input type="checkbox"/>	Geology /Soils
<input type="checkbox"/>	Hazards & Hazardous Materials	<input type="checkbox"/>	Hydrology / Water Quality	<input type="checkbox"/>	Land Use / Planning
<input type="checkbox"/>	Mineral Resources	<input type="checkbox"/>	Noise	<input type="checkbox"/>	Population / Housing
<input type="checkbox"/>	Public Services	<input type="checkbox"/>	Recreation	<input type="checkbox"/>	Transportation/Traffic
<input type="checkbox"/>	Utilities / Service Systems	<input type="checkbox"/>	Mandatory Findings of Significance	X	NONE

DETERMINATION:

On the basis of this initial evaluation:

- ☒ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- ☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- ☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- ☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- ☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Robert W. Floerke, Regional Manager, Central Coast Region

Date

Sonke Mastrup, Deputy Director, Wildlife and Inland Fisheries Division

Date

EVALUATION OF ENVIRONMENTAL IMPACTS:

- 1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
- 2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
- 3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.
- 4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from Section XVII, "Earlier Analyses," may be cross-referenced).
- 5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:
 - a) Earlier Analysis Used. Identify and state where they are available for review.
 - b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
 - c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.
- 6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.
- 7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.
- 8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.
- 9) The explanation of each issue should identify:
 - a) the significance criteria or threshold, if any, used to evaluate each question; and
 - b) the mitigation measure identified, if any, to reduce the impact to less than significance

Environmental Analysis

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
I. AESTHETICS -- Would the project:				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
II. AGRICULTURE RESOURCES -- In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
III. AIR QUALITY -- Where available, the significance criteria established by the				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
IV. BIOLOGICAL RESOURCES -- Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
(including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?				
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
V. CULTURAL RESOURCES -- Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in '15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to '15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
d) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
VI. GEOLOGY AND SOILS -- Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
VII. HAZARDS AND HAZARDOUS MATERIALS -- Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
involving the release of hazardous materials into the environment?				
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
VIII. HYDROLOGY AND WATER QUALITY -- Would the project:				
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)				
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
j) Inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
IX. LAND USE AND PLANNING -- Would the project:				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
X. MINERAL RESOURCES -- Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
XI. NOISE -- Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
XII. POPULATION AND HOUSING -- Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
XIII. PUBLIC SERVICES				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
XIV. RECREATION --				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
XV. TRANSPORTATION/TRAFFIC -- Would the project:				
a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
f) Result in inadequate parking capacity?	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
XVI. UTILITIES AND SERVICE SYSTEMS -- Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
g) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
XVII. MANDATORY FINDINGS OF SIGNIFICANCE --				
a) Does the project have the potential to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?				
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

EXPLANATIONS TO CHECKLIST ANSWERS:

I. AESTHETICS

a, b, c, and d. – No impact. Native vegetation dominates the Wildlife Area. No infrastructure developments other than improving the existing parking areas, adding interpretive and boundary signage or trails, and repairing or removing existing fencing is proposed. Temporary visual changes to the vegetation may occur from non-native plant management, but natural regeneration and/or replanting of native species will follow. No nighttime lighting is proposed.

II. AGRICULTURAL RESOURCES

a. No impact. The Wildlife Area is not Prime Farmland, Unique Farmland, of Farmland of Statewide Importance.

b. No impact - The use of the area for wildlife and open space is consistent with its County zoning which is agricultural. The area is not covered by a Williamson Act contract.

c. Less than Significant Impact - This Plan does not propose any significant changes in the agricultural practices that have existed on the property in recent historic time. None of the Wildlife Area has evidence of having ever been farmed or put to intensive agricultural use. The Gamble family used the area for cattle ranching and small mining claims in the 1920s to the 90s, before selling to Homestake Mining Company. (See subtitle: Historical Land Use, page 18). The Department may, in the future, use limited,

controlled grazing for weed management, and small areas may be managed intensively for weed control and planting of forage for wildlife.

III. AIR QUALITY

a, b, c, d, and e. – No Impact. Management of the Wildlife Area will not affect air quality, add pollutants, or create objectionable odors affecting a substantial number of people.

IV. BIOLOGICAL RESOURCES

a. – No Impact. The Wildlife Area is specifically managed with an Ecosystem Approach to benefit Special Status Species, other native species and game species. All activities will be in conformance with State and federal endangered species regulations and will be evaluated for potential impacts on Special Status Species.

b and c. – No Impact. Natural riparian areas will be improved both biologically and ecologically by removal of non-native tamarisk and regeneration of the native riparian vegetation. There are no plans to alter any of the serpentine soil areas. No wetlands other than man-made water retention ponds for cattle are known to occur on the property. The Department may maintain the berms that retain year round water for use by wildlife.

d and e. – No Impact. One of the purposes of the Wildlife Area is to maintain habitat for wildlife movement. The existing barbed-wire fencing does not restrict the movement of any wildlife species. Management of the Wildlife Area will not conflict with any ordinances that protect biological resources.

f. – No Impact. This Plan does not conflict with any Habitat Conservation Plan or Natural Community Conservation Plan. The acquisition of the Wildlife Area by the Department was supported by the local land conservation groups, including the Blue Ridge Berryessa Natural Area group (see subtitle: Acquisition of the Wildlife Area, page 16).

V. CULTURAL RESOURCES

a, b and d. – Less than Significant Impact.

The Plan incorporates two previous Cultural Resources Analyses that were conducted to evaluate the potential for impact on historic and archaeological resources due to construction of the three parking areas, continuing road maintenance, or proposed weed management and wildlife forage improvement projects. Cultural sites were or will be avoided and/or protected and all recommendations have been or will be followed to prevent significant impacts to cultural resources. No future substantive physical changes to the Wildlife Area will occur without site specific cultural evaluation by qualified professionals.

c. – No Impact

The projects discussed in this Plan do not alter any unique paleontological or unique geologic feature.

VI. GEOLOGY AND SOILS

a. – No Impact. The Management Plan does not propose the construction of human-occupied facilities other than temporary-use facilities such as restrooms. Public road access to the Wildlife Area is by the Berryessa Knoxville county road. Berryessa Knoxville road crosses Eticuera Creek in many places by in-stream cement floodways. The road and the crossings experience erosion and flood events that have the potential to create dangerous driving conditions. This road and its crossings are not owned or maintained by the Department.

b. – Less than Significant Impact. The Department will continue to remove tamarisk along Eticuera

Creek which will reduce the vegetative cover along the creek which could temporarily increase soil erosion in the creek bed. Natural regeneration and some additional riparian planting of native trees and shrubs will prevent this impact from being substantial.

c, d, and e. – No Impact

No buildings or septic systems are proposed.

VII. HAZARDS AND HAZARDOUS MATERIALS

a, b, c, d, e, f, and g. – No Impact

Not applicable to the Wildlife Area.

h. – No Impact. The Wildlife Area is not intermixed with residential or urbanized areas. The Wildlife Area is subject to periodic wildfire events due to the flammability of the vegetation. Recent wildfire events (1999 and 2004) combined to consume much of the 8,000+ acre Wildlife Area. Public visiting the area during the high-fire danger season are potentially exposed to wildfire risk.

VIII. HYDROLOGY AND WATER QUALITY

a, b, c, d, e. – No Impact. The Plan does not propose any changes to the existing natural drainage patterns in Knoxville Wildlife Area. The Plan does propose maintaining the existing ponds and existing water rights for wildlife use. These ponds were originally constructed for watering cattle and fire prevention.

f. – Less than Significant Impact. The Wildlife Area does not have piped, treated drinking water or restrooms. Any use of the area by mammals (humans, horses, dogs, and mammalian wildlife) increases the potential for waterways to become contaminated. Under current regulations, the public is allowed to primitive camp (carry in, carry out all supplies) for up to fourteen days. The majority of the public are aware of the potential of waterways to carry bacterial parasites and most people carry their own drinking water for day hikes or bring a water filter. The extremely low level of use of the Wildlife Area at this time makes this impact less than significant.

g, h, i, j. – Not applicable to this project.

IX. LAND USE AND PLANNING

a, b, and c. – No Impact. The Wildlife Area does not divide an established community, conflict with any landuse plan, or conflict with any applicable habitat conservation plan or natural community conservation plan.

X. MINERAL RESOURCES

a, and b. – No Impact.

XI. NOISE

a, b, c, d, e, f. – No Impact.

XII. POPULATION AND HOUSING

a, b, and c. – No Impact.

XIII. PUBLIC SERVICES

a, and b. – No Impact. The intensity and frequency of public use in the Wildlife Area is historically very low (it was open to the public in 2000). This Plan contains provisions for additional coordination with local public service and law enforcement agencies to deal with any future impacts as well as the proposal for additional Department law enforcement staffing.

XIV. RECREATION

a, and b. – No Impact.

XV. TRANSPORTATION / TRAFFIC

a. – Less Than Significant Impact. The Wildlife Area is served by one narrow, un-striped, winding County road; Berryessa-Knoxville Road. This road crosses the Eticuera creek about five times via paved stream crossings. There are no intersections to other County roads inside the Wildlife Area. The type of road and the remoteness of the location naturally dictate slow driving speeds. The increased traffic on this County road will be within its capacity.

b, c, and d. – No Impact.

e. – Less Than Significant Impact. The Wildlife Area is open to public use by foot, bicycle, and horse access only. Several miles of old ranch road are maintained by the Department for management and emergency response. However, because of the remoteness of the area, emergency response would be most practical by helicopter.

f. – Less Than Significant Impact. The Department has constructed three parking areas for public use.

XVII. Mandatory Findings of Significance

a. – No Impact. This Plan is supportive of habitat and wildlife species and cultural resources. It does not have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory.

b. – No Impact. This Plan does not authorize any substantive physical changes and any unknown, future projects will require subsequent analysis when the specifics of a project are established. There are no impacts that are individually limited, but cumulatively considerable to the point of significance.

c. – No Impact. This Plan provides for compliance with all applicable laws and requirements. It does not authorize any substantive physical changes and any unknown future projects would require subsequent analysis when the specifics of a project are established. It will not have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly.

INFORMATION SOURCES:

1. Knoxville Wildlife Area Management Plan. – DRAFT - June 2005. Department of Fish and Game, Central Coast Region.
2. A cultural resources study within the Knoxville Wildlife Area, Napa County, California. May 2004. Anthropological Studies Center, Sonoma State University.

Appendix K.

Public Comments and Responses to Comments

The Knoxville Wildlife Area Draft Management Plan public review and comment period was July 15 to August 15, 2005. The Initial Study/Negative Declaration was posted at the Napa County Public Library, the Woodland Public Library, the Department of Fish and Game Central Coast Region's office in Yountville, and on the Department's internet web page at www.dfg.ca.gov. It was also circulated to the following public agencies for review: Resources Agency; Regional Water Quality Control Bd., Region 5 (Sacramento); Department of Parks and Recreation; Native American Heritage Commission; Office of Historic Preservation; Department of Water Resources; Department of Conservation; Caltrans, District 4; Caltrans, District 3. None of the public agencies responded with comments.

The following individuals and/or interest groups along with the subject area of their comments are listed below.

- Jim Eaton, Tuleyome, Inc. – re: opposition to the adoption of a Negative Declaration in regards to allowing hunting at the KWA, wilderness designation, opposition to the adoption of a Negative Declaration in regards to allowing grazing at the KWA, no shooting zones, remaining ranching infrastructure, cultural resource protection and habitat manipulation for game species
- Harris & Thompson, attorneys representing Dusty Sanderson – re: Dusty Sanderson's mineral claim.
- Cathy Haagen-Smit, International Mountain Bicycling Association – re: mountain biking and bike trails at the KWA.
- Ryan Henson, California Wilderness Coalition – re: wilderness protection and lack of designation of the KWA as wilderness.
- Carol Kunze, Berryessa Trails and Conservation group – re: working with volunteer groups, appropriateness of bicycle use within KWA, biological resources, invasive species, allowable uses, and trail development.

Tuleyome, Inc.

P.O. Box 74304
Davis, CA 95617

August 15, 2005

Tina Fabula
Associate Wildlife Biologist
Assistant Lands Coordinator
P.O. Box 47
Yountville, CA 94599

Dear Ms. Fabula,

Tuleyome is pleased to have this opportunity to comment on the draft Knoxville Wildlife Area Management Plan (Plan).

On the whole, we support most of the objectives and recommendations set forth in the Plan. For the most part, the Plan will protect the outstanding natural, wilderness, and recreational values of this important area. Unfortunately the Department of Fish and Game's bias in favor of hunting (i.e., bias in favor of "game species") too often seems in conflict with many of the excellent goals on maintaining the ecological health of the Knoxville Wildlife Area (KWA).

The potential impacts from habitat manipulation for game species and the possibility of hunting predators (e.g., coyotes, bobcats, and gray foxes) require that this plan be accompanied by an Environmental Impact Report. The Negative Declaration submitted by DFG is not adequate, considering the potential impacts of some of the uses proposed by the Plan.

In addition, *Tuleyome* finds that since the Wilderness Assessment agrees that much of the KWA qualifies as a state wilderness area, DFG should be proud to recommend the first such area on DFG lands, rather than finding excuses to oppose wilderness designation. The goals of the plan to maintain a healthy ecosystem can be met through the designation of this area as wilderness.

Wilderness Assessment

"Eligibility of the KWA for wilderness" [Page 56] As the Plan correctly points out, the 1,517 acres on the west side of the Berryessa-Knoxville Road is smaller than the acreage guideline in the California Wilderness Act. Since the Lauff Ranch, adjacent to the KWA, may come into state ownership, the wilderness review of this part of the KWA may need to be addressed at a future date.

[Page 57] As mentioned in the Plan, many of the developments (such as corrals) are on the edge of the potential wilderness and either be restored to a natural setting or the

wilderness boundary drawn to exclude these signs of humankind.

[Page 57] The fact that a visitor “is unlikely to ... hear a motorized vehicle (save an occasional airplane)” is immaterial. Congress frequently has designated wilderness areas where a visitor might be impacted by sights and sounds of civilization outside the wilderness, and the California Wilderness Act is more lenient than the federal act in its definition of wilderness.

“Compatibility of wilderness designation with the management goals of the KWA” [Page 58] As stated in this section, wilderness designation would have minimal effect on public uses of the area, aside from the use of bicycles or carts.

The biggest impact of wilderness designation for portions of the KWA would be on DFG’s ability to use motorized and mechanized equipment. However, other managers of state land (primarily the Department of Parks and Recreation) are able to manage over a half million acres of state wilderness. They are able to construct and maintain trails and horse corrals, conduct prescribed burning, control invasive species, restore native plant species, and provide for wildlife needs.

DFG states that it currently uses chainsaws, tractors, all-terrain vehicles, other motor vehicles, bulldozers, water pumpers, and other heavy equipment to manage the KWA. *Tuleyome* maintains that while some agencies *like* to use motorized and mechanized equipment, it is not *necessary* for them to do so.

These same arguments were used by many federal agencies in years past to justify their recommendations against proposed wilderness areas. Yet today there are 14 *million* acres of federal wilderness in California that are successfully managed under wilderness management guidelines.

While we appreciate that most of the Plan for the KWA should preserve the eligibility of the KWA for future wilderness designation, *Tuleyome* respectfully suggests that DFG reconsider its opposition to wilderness in this Plan.

Management Goals and Tasks

For the most part, the “Management Goals and Tasks” are quite good. Many of the “Biological Elements” are based on sound science with “Tasks” that are appropriate and achievable. This is especially true of the goals of maintenance of a healthy ecosystem and the elimination of non-native species.

However, “Biological Goal 1.8 Maintain or simulate natural plant-herbivore interactions” [Page 78] falls short of most of the goals and tasks mentioned elsewhere. “Task 1.8.1” simply states “consider reintroduction of native grazers (i.e., elk)” with no additional analysis. Considering that Knoxville is a State Wildlife Area, it would seem that the consideration of the reintroduction of a native species such as elk would be a high priority.

Instead, "Task 1.8.2" [Page 78] recommends that we "consider using carefully managed cattle grazing to promote native grasses and forbs and to control non-native invasive species."

For the past decade, there has been no cattle grazing on the former Knoxville Ranch, now the KWA. And with the expiration of the grazing lease on the former Payne Ranch and the nonuse of the Perkins Creek Allotment, there currently are no cattle grazing the lands in the adjacent Cache Creek Management Area managed by the Bureau of Land Management. *Tuleyome* would like to see the elimination of commercial grazing become permanent in this area. This would include the use of cattle as a "management tool."

In 1997, California had roughly 16.4 million acres in federal grazing allotments, including 6.4 million acres managed by the BLM (Agricultural Issues Center). It is important to have lands without commercial grazing for research on how these ecosystems respond in the absence of livestock. This area has the potential for studying a wide variety of ungrazed ecotypes, especially when it is recognized that these lands are adjacent to other ungrazed lands managed by the Bureau of Land Management and the University of California's McLaughlin Reserve.

The negative impact of livestock grazing on native biodiversity in North America is well documented (Noss and Cooperrider, 1994) (Jones 2002; Wuerthner and Matteson 2002). While the impacts of livestock grazing is spread across the landscape, degradation of wetlands is especially harmful (Belsky, Matzke, and Uselman, 2002; Kauffman, 2002). It is abundantly clear that elimination of grazing from riparian areas can result in significant improvement in habitat and fish population. (Roach 1995; Fouty 2002)

Grazing can be very non-selective and may endanger sensitive non-target species. Livestock can trample desirable sensitive species and spread noxious weeds over a wide range when seeds become attached to hair or when they remain intact after passing through the digestive system (DiTomaso 2002).

DFG's plan to use grazing as a "tool" for weed reduction appears to be limited to controlling yellow star thistle on the KWA. We are opposed to this plan.

A native of Eurasia, yellow star thistle was introduced to California around 1850 and has spread to 10 to 15 million acres in the state (Kuntz). Just as the spread of star thistle and other weedy species on the former Payne Ranch is likely due to cattle grazing (BLM Ukiah 2002), cattle grazing probably is the reason for the invasion of non-native species at the KWA. The loss of native bunch grasses also is likely due to cattle grazing.

The species that invade and increase following the decline of the bunch grasses are often aggressive nonnative species such as star thistle and medusa head. These exotics tend to be more fire prone (they dry earlier in season, for example) and thus fire frequencies increase. Native plants normally can recover from fire, but under conditions of overgrazing, they can be so stressed that recovery is more difficult,

allowing the exotics to increase still further. (Muir 2002)

There has been only one study published examining livestock's relative use of California native and alien grasses. The livestock preferentially avoided the aliens and preferentially ate the natives (especially in the long California dry season)—not exactly reducing competition for the natives (Van Dyne and Heady 1965).

Grazed yellow star thistle flowers later and with less seed sometimes, but it often increases in overall cover. Soil surface disturbance encourages star thistle. In addition most grazing animals prefer the perennial grass over star thistle (Rosentreter).

In the East Bay Regional Park District's Round Valley Regional Preserve prescribed fire has been used to control yellow star thistle. Alternatives of mowing, disking, and chemical treatment were determined not to be appropriate in this area due to anticipated environmental impacts and damage to the archeological resources in the park, and livestock grazing had been shown to increase the spread of the thistle. (Bouska 2001)

The 27,000-acre San Luis National Wildlife Refuge has upland areas where yellow star thistle comprises 80 to 90 percent of all plant species. Tule elk are found in a 761-acre enclosure on the refuge. Refuge managers conducted a study on the elk enclosure comparing different methods of star thistle control. For three years they burned 100 acres, treated 100 acres with the herbicide Transline, released bio-control Eurasian beetles on another 100 acres, and left 100 acres untouched. The results were a little surprising. As expected, the Transline treatment achieved a 70 percent reduction in star thistle plants, but managers found that the much-cheaper prescribed burning had equally effective results. In fact, the results were so good that managers have since burned the control plot and 300 acres outside the elk enclosure (Kuntz).

Elimination of star thistle may take years. Three or more years of intensive management may be necessary to significantly reduce star thistle. It is believed that established star thistle, with a large residual seed bank, will require a longer-term management program (DiTomaso 2002).

If grazing is used, it takes skill and experience to determine stocking rates and to care for the animals properly, thus a handler with vegetation management experience is necessary. Grazing earlier than late May or June, at the rosette stage, favors yellow star thistle development by elimination of competitive plants which do not regrow as quickly. Since most defoliated star thistle will recover from one grazing, it is necessary to bring the animals back one to four times at about two-week intervals under rotational grazing. (IPM 2002)

The cost to use cattle to manage yellow star thistle and other exotic plants is high. This will be especially true since the cattle must be brought back multiple times during the season, and this process must continue for a number of years. Yet DFG's "Materials, supplies, and capital equipment" budget for this Plan is only estimated to be \$80,000 annually, and this includes all office supplies, materials, fuel, and small tools. Any funds

left over would not nearly be enough to pay for a conventional grazing operation, let alone one where cattle must be contained in a small area for only a few days, then repeatedly moved to new areas.

It must be recognized that control of weedy species such as yellow star thistle may take years or even decades. Once a piece of land that has been disturbed for a long time is released from the disturbance, it begins what ecologists call Secondary Succession. The result of Secondary Succession is weed dominance and a succession of different weed species for many, many years. The length of time depends on the degree of the disturbance and the size of the disturbance. The longer and greater, the less chance for native seeds to reinvade the site once the weeds restore the soil to a condition which will support them. When historical range lands are rested, weeds will take over and dominate the appearance for years or even decades. Cattle only keep the appearance of weeds down (all of the plants are weeds, and they just get grazed or trampled so you don't "really" see them) and weeds eliminate native plant and wildlife habitat. (Wuerthner 2000)

"Recent calls to use livestock to control weed infestations appear unlikely to succeed. Preferential grazing of native plant species over non-indigenous species by livestock, combined with livestock's disturbances of soils, microbiotic crusts, mycorrhizae, nutrients, and fire cycles, will likely keep these communities open to invasion and prevent community recovery. Not until plant communities and soils are allowed to recover their natural defenses such as healthy, deep-rooted native plants and intact microbiotic crusts will the spread and dominance of non indigenous weeds in the American West be reduced or reversed." (Belsky and Gelbard 2000)

For those reasons, *Tuleyome* opposes grazing on the lands in the KWA, whether this be by traditional leases or by using cattle as a management "tool." As expressed by ecologist David Dobkin, "We desperately need information on how these ecosystems respond in the absence of livestock in order to understand how they work. You can't do that when livestock are still a part of the system, because their impact alters everything." (Durbin 1997)

DFG should also be aware that the Central Valley Regional Water Quality Control Board is concerned about the impacts of grazing on mercury-contaminated soils, such as those which may be present at KWA. Amendments currently being considered for lands adjacent to the KWA to the north include Regional Board staff recommendations that "grazing moratoriums be reviewed for their effectiveness against erosion. The moratoriums should be either renewed or amended to further reduce erosion in mercury-enriched areas." (Central Valley Regional Water Quality Control Board)

An Environmental Impact Report must be conducted should this grazing element remain in the plan.

"Task 1.8.2," [Page 78] different from the "Task 1.8.2" discussed above, would consider "introduce wildlife forage in plots in appropriate areas to enhance or maintain viable populations of game species (quail, deer, turkey, or dove)." *Tuleyome* would like to

caution that the manipulation of the natural environment to favor game species may come at the expense of other plant and wildlife species. We oppose manipulating the KWA to “enhance” game species.

“Task 1.9.2” [Page 79] calls to “abate high priority erosion sources with earthmoving and by revegetating with native species as necessary.” Again, we urge caution in using earthmoving equipment lest erosion be increased. Revegetating with native species seems a better option.

“Task 3.2.5” [Page 80] would “route regional trails ... away from sandstone bluffs to protect prairie falcon breeding habitat.” While we support protecting falcon breeding habitat, DFG also should consider no shooting zones as well to minimize disturbance to nesting birds.

“Task 4.1.3” [Page 81] states: “maintain or improve food sources for game species. This may include planting, disking, mowing or other habitat management practices.” Again, Tuleyome would like to caution that the manipulation of the natural environment to favor game species may come at the expense of other plant and wildlife species. We oppose manipulating the KWA to “enhance” game species.

“Management Constraints on the Biological Elements” [Page 82] states that “For example, managers of BLM land will need to consider a multiple-use mandate that provides for commercial uses (e.g., mining or wind energy development) of the land.” Most of the BLM lands adjacent to the KWA are proposed for wilderness designation. Should Congress establish federal wilderness on these lands, any threats of mining, wind energy development, or other such uses would be eliminated.

“Public Use Element 1: Compatible public use” proposes “the restriction of certain uses such as bicycling and horse riding to a limited number of designated ranch roads.” [Page 82] Tuleyome strongly supports the idea that trails are considered closed to certain uses unless specifically posted as open. It is far easier to control such uses now, before they become established in area inappropriate with the goals of managing the KWA.

“Task 1.1.4,” [Page 83] regarding identifying appropriate trails. See comments directly above.

“Public Use Element 2: Public access.” states that “additional trail development, particularly on the steep and densely vegetated slopes leading up to Blue Ridge would be incompatible with the biological goals of this Plan (i.e., they would promote erosion and provide corridors for introduction of invasive species). [Page 83] While this statement sounds good, we expect there is little evidence to support it. The northern part of the Blue Ridge Trail climbs over 2,000 feet in very steep terrain, but the well-designed and constructed trail results in little erosion (especially in comparison to roads). Similarly, DFG’s proposal to use cattle in the KWA would seem to be infinitely more likely to result in the spread of invasive species than hikers. *Tuleyome* does not believe that adequate evidence exists to conclude that hiker access (as opposed to access

by horses, mountain bikes, and vehicles) results in significant impacts to biological resources, and requests that DFG either provide adequate evidence to support the quoted contention or remove it. Considering the public support for an extensive Blue Ridge Trail, similar demand for additional access to this trail across public land should be expected. DFG should anticipate this demand, rather than dismiss it outright.

"Task 2.1.3" [Page 84] calls for improved "access from the BLM road along the north boundary of the KWA." Since this road is subject to washouts (and subsequent erosion) and is a source of vehicle trespass onto public lands, *Tuleyome* suggests that DFG not proceed with any improved access until the erosion and trespass issues are addressed.

"Public Use Goal 3.1" [Page 84] suggests that there is the "opportunity for [hunting] rabbits, quail, dove, squirrels, coyotes, bobcats, and gray foxes." Hunting of a large number of species inhabiting the KWA could be in direct conflict with the Plan's goals of maintenance of a healthy ecosystem and the elimination of non-native species. An Environmental Impact Report must be conducted should this element remain in the plan.

"Facility Maintenance Goal 1.5 Remove remnants of recent human activity (tanks, fences, etc.) provided that such remnants have to historical or management value." [Page 88] "Removal of ranching improvements will increase the wilderness value of the KWA." *Tuleyome* supports this goal. There is no need to retain paddocks, corrals, tanks, storage sheds, and water troughs in a State Wildlife Area.

"Facility Maintenance Element 2.1. Maintain stock ponds and water delivery systems with value for management or wildlife habitat, repair or remove non-functional dams." [Page 89] *Tuleyome* believes that there are many water facilities designed for providing water to cattle that can be removed to enhance the overall ecological health of the KWA.

"Facility Maintenance Element 3.1. Catalog and preserve all cultural resources..." [Page 90] *Tuleyome* strongly supports preservation of cultural resources in the area.

As mentioned above, *Tuleyome* supports many of the objectives and recommendations set forth in the Plan. Thank you for this opportunity to comment on the draft Knoxville Wildlife Area Management Plan.

Sincerely,

Jim Eaton

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Fish & Game

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AN ASSOCIATION OF ATTORNEYS

AUG 11 2005

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August 10, 2005

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Sacramento, California 95814

Re: Knoxville Wildlife Area

Dear Sirs and Madams:

This office represents Mr. Dusty Sanderson in regards to his mineral rights pertaining to portions of the property which is included in the proposed Knoxville Wildlife Area (“KWA”) Management Plan (the “Plan”), which is out for public review with comments due by August 15, 2005.

Mr. Sanderson is concerned that the Plan does not properly address his rights to explore and develop his mineral rights. Mr. Sanderson requests that his rights be formally acknowledged in the Plan so as not to affect his title or adversely affect his ability to raise funds for mineral development.

The Plan purports to limit road construction and (although not formally addressed) mining activities in the KWA. These limitations would clearly infringe upon Mr. Sanderson’s right to develop his oil, petroleum, coal oil, naphtha, mineral or carbon oil, gas, asphaltum, hydrocarbons, and all similar or kindred things or substances (the “Minerals”).

Mr. Sanderson has previously provided to Ms. Tina Fabula of the Department of Fish and Game, proof of an undivided 100% ownership of a mineral reservation affecting 5,350 acres (significant portions of which are situated within the KWA) which is senior to the creation of the KWA. Mr. Sanderson holds a perpetual right to enter, explore, and mine for the Minerals, including the right to create roads, build buildings, and disturb the surface at any time with only the requirement to reimburse the surface owner \$50.00 per acre disturbed.

The Plan does officially recognize that Homestake Mining Company made its conveyance of the South Knoxville Ranch to the State of California subject to several mineral reservations including the reservation to Mr. Sanderson’s predecessor-in-interest. However, there is no acknowledgment of the right of those mineral holders to develop their interests.

The Public Outreach Summary states that motor vehicle use and commercial activity are primary concerns of the public. Mr. Sanderson is concerned that the Plan will create the impression that no new roads can be established within the boundaries of the KWA and no increase in traffic will be allowed. This does not acknowledge Mr. Sanderson’s legal right to create new roads and employ such traffic as is reasonably necessary to develop his Minerals.

Knoxville Wildlife Area

August 10, 2005

Page 3

The Plan further appears to restrict or limit “adverse effects on scenic vistas,” “strong seismic ground shaking,” and “objectionable odors.” Clearly these might affect Mr. Sanderson’s legal right to develop his mineral interest as well.

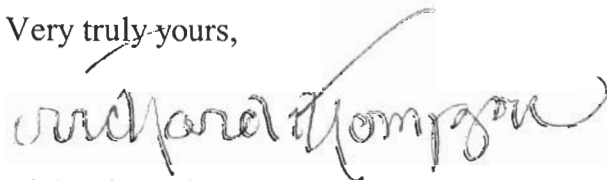
The Plan cannot prohibit my client from pursuing the activities described above. Furthermore, unless the Plan formally acknowledges Mr. Sanderson’s rights it could affect his ability to raise funds to explore, develop, and mine the property, or to subdivide those rights by lease or sale to exploration companies or other interested parties.

At a meeting on June 13, 2005 between Mr. Sanderson and various environmental groups, including Ms. Fabula representing the Department of Fish and Game, an interest was shown in potentially purchasing Mr. Sanderson’s rights in order to extinguish the mineral reservation and reunite the surface and mineral estates so that the area could be protected in perpetuity. Mr. Sanderson hereby goes on record as being willing to entertain an offer to acquire his interests. If the Department of Fish and Game, or any other group is interested, please contact this office within thirty (30) days. Thereafter, Mr. Sanderson intends to begin the process of developing his mineral rights.

In the absence of an offer, Mr. Sanderson hereby officially requests that the Plan include a formal acknowledgment of his rights under the Mineral Reservation attached as Exhibit A and that the Mineral Reservation be appended to the formal Plan when adopted.

Thank you for your attention.

Very truly yours,

A handwritten signature in dark ink, appearing to read "Richard K. Thompson", with a long, sweeping flourish extending from the end of the name.

Richard K. Thompson

RKT:hhr
enclosure

cc: University of California
Business Contracts Officer
Stephen T. Buehl, Esq.

NRS Reserve Director
General Counsel to the Regents
McLaughlin Mine, Manager



I·M·B·A

International Mountain Bicycling Association PO Box 7578 Boulder CO 80306 USA 303.545.9011 www.imba.com

Fish & Game

August 11, 2005

AUG 15 2005

Department of Fish and Game
Attn: Project Manager,
Knoxville Wildlife Area Management Plan
P.O. Box 47
Yountville, CA 94599

Yountville

Dear Project Manager:

Thank you for this opportunity to comment on the Department of Fish & Game's intention to adopt a Negative Declaration for the management of the Knoxville Wildlife Area. DFG has presented the public with a good CEQA document and has written a good general policy guide for the management of the Knoxville Wildlife Area in the Final Draft Management Plan.

As one of the Northern California representatives for the International Mountain Bicycling Association (IMBA), I represent thousands of mountain bicyclists who appreciate the efforts that land managers take to balance resource protection and recreational access to public lands. In this instance, we appreciate being recognized as stakeholders who potentially use the Knoxville Wildlife Area for passive outdoor recreation.

IMBA appreciates the thoughtful analysis regarding wilderness designation for the KWA in Chapter IV of the Final Draft Plan. IMBA favors appropriate protections against harmful development, but stands to loose access in officially designated wilderness areas. Similarly, the DFG has recognized the restrictions wilderness designation would place on staff in managing habitat, performing resource inventories, doing research and repairing the old ranch roads and stock ponds. We feel the Knoxville Wildlife Area Management Plan includes appropriate provisions for protecting natural resources while allowing access by mountain bike. (Page 58-59, Final Draft Plan.)

Under Chapter V of the Plan, DFG has presented a good analysis of compatible uses for the KWA. IMBA's position has long been that mountain bicycling is human powered recreation that is as compatible as hiking is with the DFG's goals of protection and enhancement of areas such as the KWA. Thank you for stating that mountain bicycling is a compatible use. Regarding hiking, the Department recognized the desire to connect to regional trails systems managed by BLM and BOR to the north and south of the KWA. (Page 65, Final Draft Plan.) Bicyclists who may be able to cover long distances in a day, would also seek to be included in any planning for trail linkages, as discussed in the hiking element.



Having ridden in BLM's Knoxville Recreation Area, I believe that the terrain of the adjacent KWA is precisely suitable for riding a bicycle with low - if any - impacts to the habitat. Thank you for referring to resources used by IMBA that point to studies indicating that a bicyclist's impact is much like that of a hiker and less than an equestrian. (Page 66, Final Draft Plan.)

You are also concerned that measures are taken to minimize environmental damage, but go on to state that impacts of bicycles on the environment "can be minimized with access restrictions that are identical to those for horses." You state this after you acknowledge bicyclists do not cause as much damage as horses. All users cause some sort of impacts and it is well recognized in trail literature that proper trail design can be sustainable. Bicyclists agree that certain restrictions are appropriate but suggest that restrictions might not have to be *identical* to those placed on equestrians, rather should be reasonably and equitably placed for ALL users, including hikers. As with the soils on BLM's nearby Payne Ranch and in the Knoxville Recreation Area, recreational use is virtually self-limiting. Heavy rains cause muddy conditions that are not good for any user. No impacts by hikers, bikers or horses are caused if they simply aren't out there. Hot or rainy weather extremes limit use and thereby limit impacts.

Conflicts and environmental impacts can be reduced by education and engineering, rather than polarizing users or restricting use. All users can become good trail stewards and can work together to assist the Department in reaching its goals.

If you have any questions, please contact me at (916) 663-4626.

Sincerely,

Cathy Haagen-Smit
Northern California IMBA Representative

7589 Ridge Road Newcastle, CA 95658 tandems2@sbcglobal.net (916) 663-4626



A Voice For Wild
California

California Wilderness Coalition
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August 15, 2005

Department of Fish and Game
Attn: Project Manager, Knoxville Wildlife Area Management Plan
P.O. Box 47
Yountville, CA 94599

Dear Sir or Madam:

The Final Draft Knoxville Wildlife Area (KWA) Management Plan outlines a number of steps the California Department of Fish and Game can take to restore, protect and ecologically enhance the KWA. We support most of the plan's provisions, especially the habitat restoration elements and the prohibition on the recreational use of off-road vehicles.

The wilderness assessment presented in the plan is quite fair and we hope its findings will be repeated in the final version. As you know from our scoping comments, our organization and many other groups and individuals would like to see the KWA become part of the California Wilderness Preservation System at some point in the future. We therefore hope that the three items listed after "the Department may" on page 59 will be changed to "the Department *will*" in the final version of the plan. Lastly, to protect wilderness values, we request that the final version of the plan prohibit bicycles from using the portion of the KWA east of Knoxville-Berryessa Road.

Thank you for considering our input.

Ryan Henson
Policy Director

From: "Carol A. Kunze" <ckunze@ix.netcom.com>
To: Tina Fabula <cfabula@dfg.ca.gov>
Date: 8/12/2005 7:31:30 AM
Subject: Comments on the Draft Plans for the Cedar Roughs WA and the Knoxville WA

Tina,

I am leaving for vacation tomorrow morning so these comments, filed on behalf of Berryessa Trails and Conservation, will be briefer than we would like and informal.

In general, we are impressed with both documents. They are clear, well-written, and will be terrific resources and guides for both trail work and future conservation projects. Well done.

A couple of general comments. While hiking is a specific activity, trails facilitate both public and agency access for other purposes (photography, agency maintenance, etc.) and it would be nice to have this mentioned. It would also be nice to see a statement that DFG is open to working with volunteers. A volunteer-friendly approach might provide access to interested and experienced workers, and ease the path for non-profit organizations such as ours, which want to build trails and carry out conservation projects, such as combatting invasive species, on public land. We look forward to working with DFG in both areas.

CRWA

I saw a river otter in Pope Creek when I was hiking down the Pope Canyon Trail (<http://sonic.net/berryessatrails/oldroad.htm>).

Arundo has been found on Pope Creek, downstream from the CRWA. From Herb's Berryessa Projects page (<http://www.herbhowe.members.sonic.net/projects/>):

Invasive Species Removal

* Arundo to be eradicated:

- o Pope Canyon and Berryessa Pines - see (map
<<http://www.herbhowe.members.sonic.net/projects/Arundo.jpg>>
and a photo

<http://www.herbhowe.members.sonic.net/projects/pope_arundo.jpg>
of clump A3 in Pope Canyon).

We would like to see primitive camping considered as an allowable activity as the report indicates, particularly for consistency with BLM CR parcel. We assume and support this not being in a fixed location, unless use develops to the point that a fixed location would be less of an impact.

We are generally OK with the decisions on horse-back riding and bicycles (no designated trails), but have not had time to confer with other members of the Trails and Recreation committee on this. We have some concerns about the decision to not prohibiting bicycles due to consistency issues with the BLM CR parcel which is up for wilderness

designation. We definitely concur with the prohibition on OHV use.

We very much support reviewing existing old roads and trails for integration into the BRBNA regional trail system, but want to be sure that DFG will consider the development of some new segments if they should be needed. It seems clear that consideration will be given to a new trail linking to the BLM Cedar Roughs parcel, but we don't want to foreclose other new segments. In general, however, we agree that we base the trails primarily on what already exists.

KWA

We generally agree with the decisions on camping and horse-back riding, and the prohibition on OHV.

We have some concern regarding designating bicycle trails as the report indicates that the area does qualify for state wilderness status and we are aware that the BLM parcel on Blue Ridge contiguous to the KWA has at various times been included in draft wilderness bills, although it is not up for current wilderness status. While not recommending state wilderness status due to the impact on costs for planned management activity, particularly activity related to combatting invasive species, the draft plan does indicate that attempts will be made to preserve the option for future designation. Bike trails will make any future designation of the KWA as state wilderness substantially less likely. In addition, the presence of bicycles do lessen the wilderness-type experience for other users. In a densely-forested area visual and physical contacts with bicycles are likely to be brief. In the KWA, however, with its long grassy valleys, many areas of sparse or virtually no trees, and overlooked by hikers on the Blue Ridge, bicycles are more likely to have a significant impact on the quality of the experience for other users.

We concur that any designated trails should be based primarily on the existing ranch roads. However, we would not want to completely foreclose the possibility of developing a new segment of trail should there be an interest in accessing a particular viewpoint, creating a necessary link, or for other reason that makes consideration of a new segment advisable. In addition, we would like the unmapped ranch roads to be considered as part of the "existing ranch roads" not with a view to making all of them formal trails, but rather to allow consideration of these routes for inclusion in the regional trail system if it should be found that such inclusion were necessary for access to a particular area or needed to create a link or loop trail.

Finally, we strongly request that the possibility of a trail linking to the Blue Ridge not be foreclosed. A trail along the Blue Ridge is planned, and there is need for access from the KWA to that trail. Indeed, according to our own experience and discussion with other hikers, a fair number of hikers already climb to the Blue Ridge from the KWA. It is an almost irresistible trek for anyone who regularly hikes in the area and is an established destination. In fact, there is already one such route mapped and posted on the Internet. It seems likely that this type of activity (hiking to Blue Ridge) will increase rather than decrease.

The invasive species issue is not persuasive. The KWA is not a pristine area in terms of native plants. No particular reason is given as to why a single trail route to the ridge would present any risk over any other type of access or use that is allowed. In addition, a well constructed trail should not present an erosion risk, whereas an unplanned social trail that would inevitably develop if no sustainable trail is built.

We therefore suggest that it would be better to create such trail access to Blue Ridge, in order to minimize the impact on other likely areas of access and guide hikers away from sensitive areas such as prairie falcon aeries.

In particular, we recommend working with BLM to develop a trail link from the top of Long Canyon, already a designated hiking route, to the dirt road across the county line which leads to a trail up to the Blue Ridge. A map of the Long Canyon route is attached and can also be viewed at <http://www.reflexpoint.org/~afulks/knoxville/longcanyon.jpg>. In addition, a map of the Blue Ridge Trail and access road is attached with a potential access trail marked in blue (map can be viewed without blue linking trail at http://www.reflexpoint.org/~afulks/blue_s/blueridge_s.htm). This would allow access to the Blue Ridge trail without having to develop a new trail to the ridge in the northernmost part of the KWA.

It is in the more southern area of the KWA that a new access trail to the Blue Ridge should be considered.

Carol A. Kunze
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Itemized Public Comments and DFG Responses:

- 1) Interest expressed in seeing DFG coordinate and work with volunteers on trail installation, trail alignment, trail maintenance, and various conservation projects.

Response: Volunteer assistance can be helpful on DFG-approved conservation projects. If DFG staff are assigned to work at KWA on such projects, volunteer recruitment and utilization will be considered.

- 2) Comment that an Environmental Impact Report (EIR) instead of a Negative Declaration is required because the KWA Management Plan will allow hunting.

Response: The Legislature has delegated authority to the Fish and Game Commission to regulate the take and possession of wildlife. The potential impacts from the legal hunting of game species in the State of California is evaluated on a yearly basis by the Fish and Game Commission through its regulatory process. A functionally equivalent environmental document is prepared to evaluate harvest levels and seasons throughout the state. The regulatory program of the Commission has been certified by the Secretary of Resources and the Commission is eligible to submit the environmental document in lieu of an EIR or Negative Declaration. (CEQA Guidelines 15252)

- 3) Opposition to the possibility of using grazing as a management tool at KWA to improve wildlife or plant habitat and a statement declaring that the use of grazing at KWA would require that an Environmental Impact Report (EIR) instead of a Negative Declaration be prepared. A separate comment was added stating that the potentially high cost of a managed grazing program has not been adequately budgeted for in the estimated KWA budget.

Response: Task 1.8.2 on page 78 has been expanded to include an outline of a managed grazing program at KWA. All goals, evaluation criteria, and monitoring protocols would be developed by DFG before utilizing grazing as a management tool at the KWA. The Department's goals for a grazing program would be to improve the existing wildlife habitat or to improve the native to non-native plant species ratio and would be monitored to ensure that those goals were met. The Department is well-aware of the potential for environmental degradation from un-managed grazing. Grazing on Department-owned lands is considered an Article 19 Exempt Project, under CEQA Guideline 15307: Actions by Regulatory Agencies for Protection of Natural Resources..."Class 7 consists of actions taken by regulatory agencies as authorized by state law or local ordinance to assure the maintenance, restoration, or enhancement of a natural resource where the regulatory process involves procedures for protection of the environment. Examples include but are not limited to wildlife preservation activities of the State Department of Fish and Game". This class 7 exemption is also expanded under Title 14 Section 757 Exempt Project (7) Class 7 (D): "Vegetation development, manipulation, or fertilization to increase habitat productivity for fish and wildlife." Finally, any managed grazing program would be designed and monitored to ensure that the activity does not have a significant impact on the environment. This Management Plan and the public review process qualify as

the environmental documentation for those wildlife improvement projects which otherwise fall under the Title 14, section 757 mentioned above.

The Operations and Management budget found on page 97 of the Management Plan is a proposed budget and is not funded by the State of California at this time. The additional costs of any managed grazing program would likely be covered by a grazing contract or be an additional amount added to the proposed KWA budget.

- 4) Request to consider no shooting zones adjacent to the falcon breeding sites that occur on the high cliffs along the eastern boundary of the KWA.

Response: This request implied that the noise from hunter's guns would impact the nesting behavior of this sensitive species, but this concern was not clearly stated.

The records of prairie falcon nests are located just outside of the KWA on BLM lands on steep cliffs. Due to the very steep terrain, lack of DFG-approved trails, and the fact that most hunting at KWA is for turkey and deer whose habitat is not found on the steep cliffs of the eastern boundary, the Department of Fish and Game believes that a no shooting area is not needed at this time.

In addition, plinking and target shooting are not allowed at KWA by Fish and Game regulation Title 14, Section 551 (c) which states; "except at designated shooting sites or with a special permit, possession in the field and use of firearms and archery equipment is permitted only for the purpose of hunting on all wildlife areas and on national wildlife refuges." (Also see page 62 of the Management Plan).

- 5) Comment in support of DFG removing most remnants of recent human activity (ex: old ranching facilities such as paddocks, tanks, sheds, etc) from the KWA if they have no historical or management value. Comment in support of the preservation of the cultural resources of KWA.

Response: comments noted

- 6) Comment to the effect that the draft KWA Management Plan does not properly address the mineral rights claimed by Mr. Dusty Sanderson and that this lack of acknowledgement of that claims might limit Mr. Sanderson's ability to develop his mineral rights. Other comments to the effect that the KWA Management Plan appears to limit road development, adverse effects on scenic vistas, strong seismic ground shaking, and objectional odors, and those limits would affect Mr. Sanderson's right to develop his mineral interests.

Response: page 9 of the KWA Management Plan outlines the purpose of a Fish and Game Management Plan. A Fish and Game Management Plan considers the Department's interest in the land, describes the area's biological resources, and outlines potential Department management actions. To the extent there are pre-existing rights or claims at the KWA (whether oil, gas, mineral or other), a Wildlife Area Management Plan will not eliminate or contravene them. Future activities proposed to be conducted on the KWA (including activities of third-parties in connection with any pre-existing oil, gas, mineral or other interests) will be part of projects that will require further analysis pursuant to the California Environmental Quality Act (CEQA).

- 7) Several comments in support of the draft KWA Management Plan in general, especially the habitat restoration elements and the prohibition of the recreational use of off-road vehicles.

Response: comments noted.

- 8) Request that the Department of Fish and Game reconsider its reasons for not designating the KWA as a state wilderness area. Additional related comments regarding how the use of bicycles at KWA may negatively affect the future possibility of a wilderness designation. Additionally, a request that the Department of Fish and Game prohibit bicycles from using any portion of the KWA east of the Berryessa-Knoxville Road.

Response: The Department stands by its evaluation of, and stated reasons for not designating the Knoxville Wildlife Area as wilderness (see pages 55-59 of the Plan). Wilderness designation does not facilitate DFG management nor accommodate all non-motorized compatible uses of the Wildlife Area. No changes to the Management Plan were made due to this comment.

- 9) Comment in support of allowing bicycles at the KWA and appreciation that the Management Plan recognizes bicycle use as a compatible public use. Additional comment requesting that any restrictions on access to trails by trail user groups due to erosion or muddy conditions be reasonable and equitably placed on all users (foot, horse, and bike).

Response: comments noted.

- 10) Request that the DFG work with bike and hike interest groups in designing additional formally-approved foot and/or bike trails that might link to other trails on public land. Specific interests were expressed in making a hiking link to the planned Blue Ridge trail on BLM lands that lie to the east of Knoxville Wildlife Area on top of Blue Ridge, a link from the top of Long Canyon to BLM lands at the north end of Blue Ridge, and finding appropriate bike linkage for bike users because of their ability to cover long distances.

Response: If DFG staff are assigned to work on trail maintenance, trail improvements, or new trail construction at the KWA, we will collect input from, and coordinate trail development with interested trail user groups (for example: the Blue Ridge Berryessa Natural Area (BRBNA) trail group) as much as possible.

- 11) Opposition to habitat manipulation for “enhancing” game species at the expense of other plant and wildlife species.

Response: Habitat manipulation for game species may involve the development of improved foraging opportunities, improved roosting or sheltering sites, improved water sources, or other critical elements which may be limited on the wildlife area. For example, controlling invasive weeds through various integrated techniques provide added benefits to all wildlife. Wildlife preservation activities

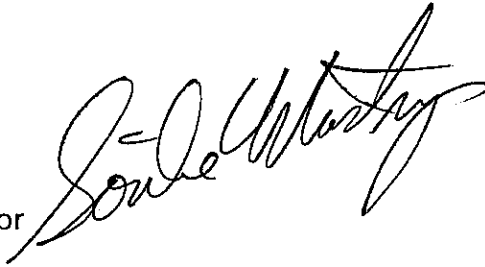
such as these are normally covered under the same class 7 exemption (Title 14 Section 757 Exempt Project (7) Class 7 (D) "Vegetation development, manipulation, or fertilization to increase habitat productivity for fish and wildlife," or (F) "Developing springs and waterholes and artificial wildlife watering devices for fish and wildlife maintenance or enhancement purposes." Additional environmental analysis and documentation will be completed prior to any management activities that have the potential to have a significant impact on the environment. This Management Plan and the public review process qualify as the environmental documentation for those wildlife improvement projects which otherwise fall under the Title 14, section 757 mentioned above.

Memorandum

To: Office of Planning and Research
Post Office Box 3044
Sacramento, CA 95812-3044

Date: October 28, 2005

From : Sonke Mastrup, Deputy Director
Department of Fish and Game



Subject : Notice of Determination for Knoxville Wildlife Area Management Plan, Napa County.
SCH 2005072084

Attached is the Notice of Determination for the final Knoxville Wildlife Area Management Plan, in Napa County. The Department of Fish and Game's Central Coast Region has fulfilled the 30-day public review period for the draft Knoxville Wildlife Area Management Plan (Plan) and proposed Negative Declaration. We have reviewed and considered the submitted public comments and addressed those comments in an appendix to the final Plan (CD attached).

In light of the environmental checklist and public comments received we have rewritten one part of the Plan (Management Goals and Tasks-Task 1.8.2, page 78) to provide a more detailed description of the conditions under which grazing might occur at Knoxville Wildlife Area. With this change, we have concluded that there is no substantial evidence that the Plan will have a significant effect on the environment and have adopted the Negative Declaration.

We will be posting the final Plan and all appendices, including public comments and our responses on the Department's website at: www.dfg.ca.gov, and at the Region office at 7329 Silverado Trail, Napa, during the 30-day NOD posting period. If you have any questions regarding these documents, please contact Ms. Tina Fabula, Associate Wildlife Biologist, at (707) 944-5538; or Mr. Larry Wyckoff, Senior Wildlife Biologist, at (707) 944-5542.

Attachments

cc: See next page

cc: Department of Fish and Game
Lands and Facilities Branch
Felix Arteaga
Teresa Le Blanc

ec: Central Coast Region
Department of Fish and Game
Mr. Robert W. Floerke
Mr. Larry Wyckoff
Ms. Terry Palmisano
Ms. Tina Fabula
Mr. Phil Pridmore
Mr. Allan Buckmann
Mr. Gene Cooley
Mr. David Casady

Notice of Determination

Form C

To: ☒ Office of Planning and Research
PO Box 3044, 1400 Tenth Street, Room 212
Sacramento, CA 95812-3044

☐ County Clerk
County of _____

From: (Public Agency) Dept. of Fish and Game
P.O. Box 47
Yountville, CA 94599
(Address)

Subject:

Filing of Notice of Determination in compliance with Section 21108 or 21152 of the Public Resources Code.

Knoxville Wildlife Area Management Plan

Project Title

2005072085

Tina Fabula

(707) 944-5538

State Clearinghouse Number
(If submitted to Clearinghouse)

Lead Agency
Contact Person

Area Code/Telephone/Extension

Berryessa Knoxville Road, Napa County, CA

Project Location (include county)

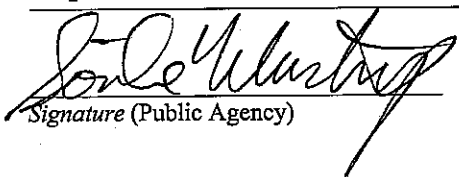
Project Description:

The project is the Management Plan for the Knoxville Wildlife Area. The Plan discusses the area's primary purpose, appropriate recreational uses, biological resources on site, and potential management activities.

This is to advise that the Dept. of Fish and Game has approved the above described project on
☒ Lead Agency ☐ Responsible Agency
and has made the following determinations regarding the above described project:
(Date)

1. The project ☐ will ☒ will not have a significant effect on the environment.
2. ☐ An Environmental Impact Report was prepared for this project pursuant to the provisions of CEQA.
☒ A Negative Declaration was prepared for this project pursuant to the provisions of CEQA.
3. Mitigation measures ☐ were ☒ were not made a condition of the approval of the project.
4. A statement of Overriding Considerations ☐ was ☒ was not adopted for this project.
5. Findings ☐ were ☒ were not made pursuant to the provisions of CEQA.

This is to certify that the final EIR/NegDec with comments and responses and record of project approval is available to the General Public at:
Dept. of Fish and Game, 7329 Silverado Trail, Napa, CA 94558 and <www.dfg.ca.gov>


Signature (Public Agency)

10/27/05
Date

Deputy Director, WIFD
Title

Date received for filing at OPR:

January 2004

California Department of Fish and Game
Certificate of Fee Exemption
De Minimis Impact Finding

Project Title: Management Plan for the Knoxville Wildlife Area

Project Location (including County): Far eastern portion of Napa County and small part of Yolo County, accessed via the Berryessa-Knoxville Road. Nearest community is Berryessa Pines, Angwin, or Lower Lake.

Name and Address of Project Proponent: California Department of Fish and Game, Central Coast Region, PO Box 47, Yountville, CA 94599

Project Description: The purpose of the management plan is to serve as a descriptive inventory of fish, wildlife and native plant communities ; provide an overview of the wildlife area's operations and maintenance activities and describe goals and general tasks to accomplish effective property stewardship. The Plan also discusses the area's primary purpose and appropriate public use.

Findings of Exemption:

1. An Initial Study has been conducted by California Dept. Fish and Game to evaluate the potential for adverse environmental impacts.
2. A Negative Declaration has been prepared by the California Dept. Fish and Game.
3. The lead agency has no evidence before it, including the information in the Initial Study, the Negative Declaration and public comments, to indicate that the proposed project could have any potential for an adverse effect on fish and wildlife resources or the habitat upon which the fish and wildlife depends.

Certification:

I hereby certify that the lead agency has made the above findings and that based upon the record, the project will not individually or cumulatively have an adverse effect on fish or wildlife resources, as defined in Section 711.2 of the Fish and Game Code.



Signature of Planning Official

Senior Wildlife Biologist

Title Fish and Game

Lead Agency Name

7/11/05

Date